Social and Cultural Impact Assessment of the Highly Migratory Species Fisheries Management Plan and the Amendment to the Atlantic Billfish Fisheries Management Plan

performed by

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for the

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A Social and Cultural Impact Assessment of the Highly Migratory Species Fisheries Management Plan and the Amendment to the Atlantic Billfish Fisheries Management Plan performed by The Ecopolicy Center for Agriculture, Environmental, and Resource Issues, Rutgers University. Completed under contract with the United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Highly Migratory Species Office.

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EXECUTIVE SUMMARY

This document is a social and cultural impact assessment of the Fisheries Management Plan (FMP) for Highly Migratory Species and the current amendment to the FMP for Atlantic Billfish. It focuses on such impacts in the five states of Massachusetts, New Jersey, North Carolina, Florida, Louisiana, and in Puerto Rico. These places were chosen for study because they each had important affected fisheries and because they are fairly evenly spread around the coast. For each place a profile of basic information was compiled and two communities that are likely to be affected by these FMPs were visited. In each community qualitative interviews were done with fishers, fishing crew, processors, leaders of fishing organizations, and suppliers. A total of 139 key informant interviews with either one or two people and five group interviews were done.

Regulatory impacts on these communities are traced through seven affected fisheries.

The first is **the pelagic longline fishery**. The basic picture of the US pelagic longline fleet and related businesses is that the best of its human and material assets are moving overseas and those that are left are increasingly marginal. This trend is being caused by many factors of which regulation is only one. The most stringent regulations of the longline fleet being considered in these plans would substantially accelerate the U.S. fleet's current decline and the movement offshore of its assets. In communities where the longline fleet is the main commercial fishery, some of the factors that are contributing to this overall decline are threatening these communities' sustained access to the resource. Aside from the artisanal fishery in Puerto Rico, the most vulnerable group described in this report is those members of the longline fleet who have not been able to participate in the global expansion of the longline business.

The second is the **bluefin tuna purse seine fishery**. Reduction in quota allocation and increased size limits would reduce the income of this fleet. Only if such a reduction were large would it begin to have an impact of the magnitude of price changes. Because the fleet has already adjusted to a very short season, it would continue to fish its quota unless reductions were very large. The impact of reductions in this quota on fishing communities would not be as great as reductions in other bluefin tuna fisheries. The effect on community attitudes would be significant because, unless such cuts were across-the-board cuts, many would see this as unfair.

The third is the **drift gillnet swordfish fishery.** Prohibition of gillnet gear for directed tuna, shark, and swordfish fishing would eliminate this fishery. Closed areas should not have a major impact as respondents report that most of the fishing is already in deeper waters. Requiring acoustic deterrents will impose costs but at a magnitude the fleet could absorb. Elimination of fishing for swordfish would lead to increased activity in fisheries that are further away leading to longer, sometime much longer, trips. The impact on the larger community of these boats doing less fishing and fishing for extended periods in distant waters would be significant.

The fourth is the **recreational bluefin tuna fishery**. Increased size limits for giant tuna would allocate more of the fishery to northern areas. Increased size limits for school tuna would continue and accelerate the ongoing loss of New York Bight communities' ability to use bluefin tuna to attract customers. Season opening dates are also essentially an allocation measure in this fishery. The positive impact on one community will mean a negative impact on another. The

pattern of the use of restricted fishing days in the general category makes a great deal of difference in Massachusetts. Weekend openings bring in much more revenue, but there is also a decrease in safety because of crowding. The presence of more amateur boats also makes it more difficult for professional fishers to catch fish. Continuous days help fishers from farther away because it gives them more steaming and fishing time. Continuous days can mean lost revenue to businesses providing tourist services and tackle. It is very important that businesses know as far ahead of time as possible the schedule of restricted days. Increased bluefin tuna size limits will have a negative impact on the recreational fishing business in the Mid-Atlantic while having little or no effect on New England.

The fifth is the **recreational shark fishery**. The proposed measures would have no significant negative impact on these communities, from the perspective of the recreational industry, because they are already fishing shark more conservatively than these regulations propose. A recovery of the shark fishery would have a significant positive effect.

The sixth is the **recreational billfish fishery.** Most proposed recreational billfish measures are less conservative than existing fishing behavior. The main exception to this is requiring catch and release format for all tournaments. Except in South Florida, where marlin tournaments are relatively less important than sailfish tournaments, this would have a significant negative impact on participation in billfish tournaments. Aside from the catch and release tournament format, there are no negative impacts on these communities of the proposed restrictions. Recovery of the stock would have the important positive impact of allowing US billfishing destinations to once again compete with foreign billfishing destinations.

The seventh is the Puerto Rico **deep water artisanal fishery**. If existing restrictions on marlin size limits and sales were enforced the result would be a loss of income for an already very poor population. The new measures being considered will have no impact beyond the existing measures.

TABLE OF CONTENTS

CHAPTER 1 - INTRODUCTION

In April 1998 the National Marine Fisheries Service (NMFS) contracted with the Ecopolicy Center at Rutgers, The State University of New Jersey to do a social and cultural impact assessment of the Fisheries Management Plan (FMP) for Highly Migratory Species and the amendment to the FMP for Atlantic Billfish. A social and cultural impact assessment is required to make several contributions to the development of the FMP.

1) Information on distributional impacts, non-quantifiable considerations such as expectations and perceptions of the alternative actions, and the potential impacts of the alternatives on both small economic entities and broader communities.

2) Descriptions of the ethnic character, family structure, and community organization of affected communities.

3) Descriptions of the demographic characteristics of the fisheries.

4) Descriptions of important organizations and businesses associated with the fisheries.

5) Identification of possible mitigating measures to reduce negative impacts of management actions on communities.

The present document is the main product of that social and cultural impact assessment. Chapter One discusses our understanding of the meaning of "social and cultural impacts," especially in relation to economic impacts, and the approach and methodology used in the study. Chapter Two is the heart of the report. It discusses the expected impact of the most substantial alternative actions being considered on each of the major affected fisheries. It concludes with a discussion of possible mitigating measures. Chapters Three through Eight contain community and state profiles. They are the information on which the discussion of impacts in Chapter Two is based.

METHODOLOGY

NMFS (1994) has created guidelines to be used in social impact assessments. These guidelines require identifying baseline conditions, scoping the full range of potential impacts from each proposed alternative, projecting estimated effects from these impacts, and predicting the significance of an potential responses to these impacts. Baseline conditions include population data, household and educational characteristics, community and institutional structures, political and social resources, and attitude variables such as views of the fishery. These guidelines were primarily designed for assessing impacts on single, well defined fishing communities. The current project however, covers four species groups (tuna, swordfish, shark and billfish) which have important commercial and recreational fisheries extending from Maine to Texas and the Carribean. Reasonable limits on time and funds precluded any attempt to cover all the affected

fishing communities.

We chose an approach that we felt would result in as accurate and comprehensive a social impact assessment as could be expected given the multiplicity of the fisheries, the geographical breadth of the affected communities, and time constraints. We chose to narrow our focus to the five states of Massachusetts, New Jersey, North Carolina, Florida, Louisiana and to Puerto Rico. These places were chosen because they each had important affected fisheries and because they are fairly evenly spread around the coast. For each place we compiled a profile of basic information on the major affected fishing communities. We also visited two fishing communities in each one (Table 2.1).

We chose the communities we visited partly by looking at landings data, but these communities are not necessarily the biggest and most important ports. We had several other choice criteria. One is the relationship between the communities and the fishing fleets. There is an important tension to be held here. National Standard Eight of the Magnuson Stevens Act (Federal Register 1998) insists that a fishing community is a geographical location, but FMPs have their most direct impacts on fishing fleets that use specific gears. The relationship between these fleets and fishing communities is not always a direct one. Indeed, this relationship is an important variable for understanding impacts. A second factor influencing our choice was the existence of other community studies. The need for doing the SIA quickly meant that we needed to find as many communities as possible about which information was already available. Finally, we relied heavily on input from the industry Advisory Panels for HMS and Billfish about which fishing communities they felt we should focus on in their areas.

Table 2.1 Fishing Communities Visited

Louisiana	West Florida	East Florida	Puerto Rico	North Carolina	New Jersey	Massachusetts
Dulac	Panama City	Islamadora	Aguadilla	Wanchese	Barnegat Light	New Bedford
Venice	Madeira Beach	Pompano Beach	Arecibo	Hatteras Village	Brielle	Gloucester

In each community we did "key informant interviews," and sometimes group interviews, with fishers, fishing crew, processors, leaders of fishing organizations, and suppliers. Constraints on time and money precluded selecting statistically valid samples, but even in the most complete research design we would only have used a formal statistical survey to refine information gathered with these types of interviews. These key informant interviews are guided discussions in which the interviewer moves the interview from topic to topic. The interviewer will ask many specific questions as issues arise, but also tries to allow the respondent to shape the terms in which the issues are framed. This helps reveal not just the respondent's perceptions of what is happening, but the meaning which the respondent attaches to these perceptions. We did a total of 139 key informant interviews with either one or two people. We also did five group interviews with more than two people: one with four charter boat captains in Islamadora FL; one with seven distant water swordfish captains, crew and a fleet manager in San Juan PR; one with eight fishers, fishing organization representatives, and recreational fishing businessmen in Brielle NJ;

one with eighteen fishers, community leaders, and fish dealers in Barnegat Light NJ; and one with five recreational fishers in Cape May NJ.

Qualitative interviews such as these get at people's perceptions very well, but are less precise than formal, quantitative surveys. They don't count anything, so there are no numbers to check. Evaluating the accuracy of the responses is done by what social scientists call "triangulation" and what others might call common sense. If several people give us different stories about something then we consider ourselves to know nothing about that thing and we either don't report anything, or report that people disagree. If several people, who are all in the same fishing sector, tell us the same thing, especially when we do nothing to lead the statement with a question (which we try not to do) then we consider ourselves to have a good idea how that part of the industry sees the issue. If we get confirmation from someone who does not share that group's economic interest in the fishery, then we are getting fairly close to knowing what is going on in that community. The firmest confirmation of our results happens when we hear the same story in community after community from people in different parts of the industry. All of these interviews took place under Rutgers University rules for "human subjects research." This means that the responses are confidential. No person or business is identified or quoted by name in this document.

In the present research, we are confident in our basic conclusions about the major fisheries, particularly the longline fleet and the recreational industry related to both billfishes and bluefin tuna. Our conclusions about the recreational shark, purse seine, harpoon, and drift gillnet fisheries are based on fewer conversations and are both less conclusive and less extensive. This is especially true of the harpoon fishery. We interviewed only one captain from one of the three marginal boats participating in this fishery in Gloucester MA. We include a brief description of these boats in the Gloucester profile, but we do not offer any assessment of impacts on the community of regulation affecting this fleet.

WHAT IS A SOCIAL AND CULTURAL IMPACT ASSESSMENT?

Our charge is to evaluate the social and cultural impacts of these management plans. These are not the same thing as economic impacts. Since fisheries regulations specifically affect the operation of businesses, understanding the difference between the two is important. An economic impact assessment focuses on changes in the overall value to the public of the resources being managed. It must consider the efficient utilization of the resource and the monetary costs and benefits of the measures. Social and cultural impact assessments follow National Standard Eight and are concerned with general importance of the fisheries resource to fishing communities. Social and cultural impact assessments also look at economic changes, but they consider how these economic changes affect the community's social structure, i.e. the groups in the community and the patterned ways these groups interact, and the culture, i.e. the meanings and understanding of the fishery that are shared within the community. One task is to identify any changes in these things which might affect the "sustained participation" of the communities in the fishery (Federal Register 1998). For example, we are very concerned in this study with boat owners and fishing crew, and the changing ways these two groups interact. An important part of this is the meaning that they give to the occupation of fishing. We have found that changes in this relationship are

related to regulations and have important implications for the ability of fishing communities to sustain their participation in the fishery.

Perhaps the greatest practical difference between social and economic impact assessments is the different ways they look at the future. Because of the nature of an economy and tools available to economics, an economic impact assessment is able to take into account the future value of the resource if and when the stock grows to a larger size. Social and cultural realities do not react to changes in such predictable ways. The people that are using the resource in specific ways now may have to change how they use the resource because of the management plan. There is no way of knowing if these will be the same people who will benefit from any recovered fish stock. Social and cultural impact statements focus on the here and now - what is going to happen to these people in this place if this regulation is promulgated. We cannot predict, for good or for ill, what might happen ten years down the road because the communities are going to be different places. This means that social and cultural impact assessments have an inherent underappreciation of conservation. More value is placed on what exists right now than what might be in the future because we are looking at what people are using, talking about, and giving meaning to in the present. The information presented here should be understood and used in that light.

BASIC CONCEPTUAL ORGANIZATION

Fishing regulations affect fishing operations in many different ways. Through our conversations with people we have identified three categories of impacts on operations that we feel are helpful in understanding how impacts happen. First, fishing regulations can affect the *volume* of money that is going through the community. In commercial operations this is a function of the amount and price of fish. In recreational operations this is a function of the amount people are willing to pay for a fishing experience. Second, regulations can affect the *flexibility* of fishing operations. This is the ability of the operation to change in response to changes in the resource, the market, or their customer base. Often regulations affect the ability of fishing operations to make plans. Many systems of regulations indirectly create uncertainties for the fishing operations that make business planning more difficult. This often has more to do with how the regulation is administered that the regulation itself. Finally, regulations can impose *direct costs* on fishing operations by requiring them to buy something or to pay someone to do something. These impacts on operations, in turn, create impacts in the broader community. Impacts on employment and overall wealth are very important, as are changes in a community's identity as a fishing community, and its perspective on the future of fishing-related activities. Social relationships such as the role of kinship and the aggressiveness of competition also affect the quality of life in the community.

We use these three categories to organize into manageable units the many regulations being considered in the alternatives of these two plans. Under volume impacts we place quotas, size limits and bycatch limits. We differentiate, however, between the quotas themselves and the derby-style organization of quota systems. The main impact of this style of organization is on flexibility. Under flexibility we also place time and area closures, whether based on by-catch or

not, controls on soak time, prohibitions, and other gear restrictions. Under direct costs we place VMS, permits, reporting, and industry-financed observers.

The magnitude and importance of any impact is also a function of the characteristics of the fishing community. We found three such characteristics to be important. The first is the existence of alternative activities, both fishing and non-fishing. The more alternatives available to someone who must change their behavior because of a regulation, the better that person is able to deal with the change. The second is economic vulnerability. This is the amount and sources of pressure and competition those in fishing related businesses face in getting the things they need to run their operations and in selling their products. The more vulnerable the fish-related operation is, the greater the impact of a regulation on the lives of the people related to that operation. The third is community support. Communities differ in the degree to which social capital, i.e., networks of people able to lend aid, is available to people and fishing operations affected by regulations. The more community support, the better the communities can absorb the impact of the regulation.

CHAPTER 2 - THE IMPACTS

This chapter discusses the major fisheries and fishery components that will be affected by the Highly Migratory Species FMP and the amendment to the Billfish FMP. Decisions about what constitutes a "major affected fishery" are based on both the types of measures being considered and the people and communities being affected. The term "fishery," in this context, includes both upstream suppliers and downstream users of fish-related products and services as they appear within the fishing communities. The guidelines for National Standard Eight of the Magnuson-Stevens Act define a community as a "social or economic group whose members reside in a specific location and share a common dependency on commercial, recreational or subsistence fishing or on directly related fisheries-dependent services and industries" (Federal Register 1998, 600.345).

Chapter Two relates the information in the community profiles to the proposed fishing regulations. In doing so relevant characteristics of the communities are mentioned but not described. Further information is available in the community profiles in Chapters Three through Eight. For each fishery component we describe first the three community-level factors discussed in Chapter One: alternatives, economic vulnerability, and community support. We then turn to the specific measures being contemplate that would have important impacts on the volume of product, the flexibility of fishing-related operations, and on the direct costs of regulation. We conclude each one with a short discussion of the expected overall impact of increased fishing restrictions on both participants in the industry and the community as a whole.

THE PELAGIC LONGLINE FLEET

General Impacts

The basic picture of the US pelagic longline fleet and related businesses is that the best of its human and material assets are moving overseas and those that are left are increasingly marginal. Perhaps the single most telling statement we heard about this fleet was from a supplier of longline tackle in Florida, who does 70 percent of his business overseas. He said that the U.S. East Coast longline fleet is the least technically sophisticated fleet he supplies. Five sources of pressure on this fleet are apparent. We list them in no particular order. The first is imports. Increasing power of foreign fishing fleets in combination with increased political emphasis on free trade have place downward pressure on the prices of most of this fleet's products. The second is land values. As recreational fishing and other coastal activities become more popular the cost of dockage and coastal community land climbs. The third is personnel. Every fishing community reports ever increasing problems with finding and holding quality employees. The magnitude of this problem, and its accompanying social dislocations, is such that if any one of these pressures is to be selected as the most ominous for the future of these communities it would be this one. The fourth is increasing distances that boats have to steam to find fish. The last is increasing regulation. While this latter category is very import, and almost always gets the most ire from fishers, many admit that it is not the worst of the problems. One of the most prominent fishers in this fleet told us, and we agree with his assessment, that if no regulations were promulgated by these fisheries management plans the relative decline of the longline fleet in

comparison with its foreign competitors would continue. Only government subsidies, which many competing fleets enjoy, would make a difference.

The central message is that the most stringent regulations of the longline fleet being considered in these plans would substantially accelerate the U.S. fleet's current decline and the movement offshore of its assets. In communities where the longline fleet is the main commercial fishery, the changes described above, particularly the inability of the fishing communities to recruit future fishers, are undermining these communities' sustained access to the resource.

The balance of this section describes the components of the pelagic longline fleet that we encountered in the fishing communities we studied.

The Gulf of Mexico Yellowfin Tuna and Shark Fleet
Dulac LA, Venice LA, Madeira Beach FL, Panama City FL

Alternatives Yellowfin tuna is still a viable fishery in Panama City, Venice, and Dulac. The Gulf of Mexico Fisheries Management Council has limited boat upgrades so that it is not feasible for the small boat shark fishers in LA to shift to the farther-out tuna. Shrimp fishing requires completely new, expensive gear. Reef fish are available, but snapper is already limited entry. Both Florida and Louisiana have banned net fishing inshore. In Madeira Beach fishers are increasingly turning to grouper. Many fishers and boats are going to Mexico. Finally, under the incidental permit and decreasing prices bluefin tuna is no longer an important, or even viable, component of this fishery. Alternatives outside of the fishery are available. While unemployment in LA fishing communities has been high in the past, and the population of those with only a high school diploma is high as well, oil industry hiring of unskilled labor has been very strong in recent years. In any case, these fishers are largely a commuter population. One Vietnamese captain reported that when he can't fish he picks oranges. The FL communities have a more educated population and lower unemployment. These areas also have a strongly developing tourism and recreational fishing industry which offers alternative employment.

Vulnerability Partly because of the availability of this alternative employment, fishing boats and related industries, particularly among the non-Vietnamese population, are experiencing a lot of difficulty finding and keeping employees. This is true for both captains and crew. All the communities are experiencing competition from imports, especially in the staple reef fishery in FL, as well as price fluctuations in the shark fishery resulting from the problem of maintaining steady supplies inherent in derby-style quota management. The Vietnamese community has avoided the personnel problems to some extent by relying on tight kinship networks in both fishing and fish buying. The Vietnamese, however, report some difficulty in finding captains. The Vietnamese community was the only one in which we heard of recent investment in new longline boats

Community Support The longline fleet is not at all integrated into the LA communities. They are commuters and most of them are from a different ethnic background. Both FL communities are fast developing tourist and recreational fishing components while the longliners are becoming

smaller and more isolated from the rest of the fishing community. The competition between fish houses is seen to be increasing and becoming more aggressive. This competition is taking more the form or offering higher prices and less based on houses building relationships by extending services and credit to the boats.

Important Specific Measures Volume: The LA boats are fishing mainly blacktip sharks and estimate that 95% of their catch is less than 50." The FL shark fleet wants sandbar shark because of the value of the fin. Their catch ranges between 30 and 80 lbs and they estimate that a 58" size limit would reduce their catch by 40-50%.
Flexibility: The LA shark fleet is already made up of smaller boats that are not particularly disturbed by the 4000lb shark trip limit. The Madeira Beach shark fleet was very opposed to these limits, but is now becoming more of a small boat fleet in response. The main desire in the shark fleet is to avoid disturbances in supply. The shark season is also open in the winter when some of the smallest boats cannot safely fish. Soak time restrictions are not a problem because the small boats already soak for around six hours. Fishers would like a year that begins on June 1st because many boats do not want to fish in the winter.
Direct Costs: The small boats are very disturbed by requirements observer and VMS requirements. An observer could cost as much as half their catch.

Expected Impact of Increased Fishing Restrictions The overall affect of more restrictions on this fleet will be increased pressure on grouper and yellowfin tuna, increased difficulty in finding and retaining employees, and an acceleration in the rate at which the fleet's boats and experienced fishers are moving overseas, especially to Mexico. Impacts on the communities of Venice and Dulac LA will be minimal, while impacts on the Vietnamese community in East New Orleans will be significant because of the extent of investment by that community in this fishery. The continuing decline in Panama City and Madeira Beach FL of the relative importance of commercial fishing will be accelerated. This will have more of an overall impact on Madeira Beach because commercial fishing plays a greater role in that community's identity.

The South Atlantic Small Boat Tuna and Swordfish Fleet
Islamadora FL, Pompano Beach FL

Alternatives Due to safety concerns and limited range, the small boat fleet fishes year round in nearby waters. Dolphin is their best alternative to highly migratory species. Past access to Bahamian waters has been lost. This loss significantly reduced their access to tuna. Inshore fishing in Florida is subject to a ban on the use of nets. Snapper, king mackerel and crab are all limited entry fisheries. Skilled captains are finding employment in the Bahamas, as well as the growing longline fleets in South Africa and South America. The longline supply business has already shifted its emphasis to supplying foreign fleets. In the urban economy of Pompano Beach, non-fishing alternatives for the fishers exist. However, unemployment is moderately high and the work force is fairly well educated, so fishers may find finding jobs in alterative industries difficult. Particularly in Islamadora, a growing recreational fishing industry provides opportunities in the charter fleet and as fishing guides.

Vulnerability The growth of recreational fishing and other uses of water access is affecting the ability of fish-related business in Pompano Beach to get the land and dockage space they need. The small boat fishery is also particularly vulnerable to price pressure from the swordfish boycott organized by the Give Swordfish a Break campaign because their main market niche is the high end users that are responding to the boycott. While these boats are experiencing increased difficulty with finding crew, this is significantly less of a problem for them than for larger longline boats.

Community Support Pompano Beach has a proud longlining heritage and there are several successful businesses that are still involved to some degree with the fleet. This gives the current small boat fleet and other longline business some networks of support. On the other hand, both Pompano Beach and Islamadora are now overwhelmingly recreational fishing communities. There is a great deal of tension, and even active dislike, the recreationalists and the longliners. The longline fleet cannot expect community support from beyond their own industry.

Important Specific Measures Volume: Fishers report that they catch many swordfish within the 30 to 35 lb range. A dealer estimated that a 41lb limit would cut back the catch by 15 percent. Flexibility: Unlike shark fishers, swordfish fishers soak the gear all night. A six hour soak would significantly increase the work they have to do to catch a fish and, given difficulties with recruiting enough crew, raises safety questions due to exhaustion. Limits on mainline length, on the other hand, would not affect them. Trip limits they see as an overall good because when a very large boat unloads its swordfish their market prices are depressed.
Direct Costs: VMS would be a major expense for these small boats but they recognize that it would increase safety. Paying observer salaries would not be economically feasible for this size of boat.

Expected Impact of Increased Fishing Restrictions
Increased HMS restrictions will mean increased pressure on the dolphin stock. The small boat longline operations are marginal enough already so any significant decrease in volume or increase in direct costs will put many of them out of business. As far as the overall communities are concerned, the disappearance of the longline fleet in either Pompano Beach or Islamadora would not be noticed. This is not the case in Dania, which is a few miles south of Pompano Beach, where there is still substantial upstream business for supplies and maintenance. The major longline supply companies in Pompano Beach have already adjusted to serving a global market.

Mid-Atlantic Mixed Longline Fleet
Wanchese NC, Hatteras NC, Barnegat Light NJ

Alternatives The Mid-Atlantic area has a number of different fisheries, but these fisheries already have many participants. The larger boats have the least options. Scallops, flounder, monkfish and dogfish are, or soon will be, severely restricted, and entering these fisheries, even when possible, would require expensive gear changes. Yellowfin and bigeye tuna are already the major target species of the larger longline boats. Loss of income from bluefin tuna, shark and swordfish will mean increased pressure on dolphin. Another "alternative" for the larger boats is to steam farther,

but prices and trip limits make this difficult. Many of the larger boats have already left. Smaller boats have multispecies gillnet fisheries available to them but these fisheries already have many participants and adding more would decrease prices even further. Experienced fishers are finding work overseas. Larger fish houses have been responding to the decline of local fisheries by dealing on a more and more global basis. Their attempts to use long-distance business to feed fish to local operations have not worked very well. Alternatives outside of commercial fishing in all three communities are in the heavily fishing-dependent tourist economy. All three communities have a fairly well educated work force with, at least seasonally, high unemployment. Finding permanent work may prove difficult for many fishers. Work at a comparable level of income would be extremely difficult for them to find. Commercial fishers have gone into the charter boat sector and into tourist-related construction.

Vulnerability Recruiting and keeping crew is a major problem in Wanchese and Barnegat Light. It is particularly a problem for the larger boats that stay out longer and require more crew. There are also several supply business in these communities that rely specifically on the commercial fishing boats to survive. Swordfish prices have been depressed by imports and the swordfish boycott.

Community Support All three of these communities strongly identify as fishing communities. Commercial and recreational fishers still see themselves as being part of the same fishing-based community. Many come from the same families. Many fishers cross over, seasonally and permanently, between the recreational and commercial sectors. Several respondents in these communities expressed personal pain at growing animosity between the two sectors. There is support of the fishing industry from the non-fishing public.

Important Specific Measures Volume: Size limits on sharks would increase discard rates. Fishers reported that this would be true at 33 lbs as well as at larger size limits. Fishers already prefer larger shark because of market concerns. Landings of bluefin tuna under incidental permit benefit larger boats, smaller boats would like to see the general category season changed to allow their participation. Prohibition of catching dusky shark would have significant impact on Wanchese fishers.
Flexibility: Trip limits on swordfish and shark have a disproportionate impact on larger boats and have contributed to some of them leaving the area or ceasing operations. Limits on soak time would increase the costs of catching fish on all boats and affect larger boats more than smaller boats.
Direct Costs: Once again, fishers recognize that VMS would increase safety but it would be very expensive for the smaller boats. Paying for observers would also be a significant burden.

Expected Impact of Increased Fishing Restrictions Increase restrictions will lead to increased pressure on, and lower prices for, dolphin and inshore species. The rate at which physical and human longline assets move overseas will increase. The size of the boats in the fleet will decline as larger boats will be the ones to be sold or to leave. There will decreased revenue for businesses and skilled service personnel within the communities that do business supplying and maintaining the commercial fishing fleet. This will be made worse by potential major cutbacks in the scallop

fishery that is important in Wanchese and Barnegat Light. Impacts of fishing regulations in these communities will be felt most severely in the winter months when the tourist economy is less able to absorb people displaced from commercial fishing.

The Distant Water Longline Fleet
New Bedford, MA

Alternatives The distant water longline fleet consists of large longline boats making very long trips. The boat are quite large and expensive to run, and many have been specialized in distant water longlining for many years. They have developed little or no history in other fisheries. While some of these boats have gone into other Atlantic Coast fisheries these factors make this a difficult option. The captains of these vessels are highly skilled. It is fairly easy for both the boats and captains to find work in the longline business elsewhere in the world. Many of these boats have already moved from the Atlantic Coast to Hawaii, others are currently for sale. The captains and crew are generally not well educated in a formal sense and it would be very difficult for them to find work outside of fishing at an income comparable to what they have made on the distant water boats.

Vulnerability The distant water fleet has used its longer reach to recruit crew members from overseas, particularly the West Indies. This has allowed them to avoid the intensity of the problems with crew members experienced on other large longline boats. The price for the lower quality swordfish they produce as a result of the length of their trips has gone down steadily because of competition for imports. They compete with foreign factory boats and frozen imports. Within this high volume market they do have the advantage of producing a product of higher relative quality. The logistics of operating such large boats and delivering fish over such long distances create costs for both the boats and the large swordfish packing houses with whom they deal.

Community Support While some members of this fleet, their suppliers, and their customers live in the New Bedford area, the distant water fleet does not attach to a geographical community in the same sense the other fleets do. Participants in this fleet are spread out all along the coast. They are fairly isolated within the communities in which they live, even when those communities are strongly integrated fishing communities like New Bedford. This isolation from other fishing people, and the length of the trips, has placed a strain on the family life of participants.

Important Specific Measures Volume: Size limits have less of an effect on the distant water boats because they target and catch larger swordfish than other boats.
Flexibility: Reduce soak time and line length would cost these boats time which is an important issue for them because of the distances and quality. A soak time provision would be very difficult to enforce for any longliner, for these boats it would be virtually impossible. Delaying off loading after closures is very important to them because the volume of their landings has a strong effect on price. Trip limits are a heavy disadvantage to these boats. Their trips are longer and larger, their costs are high, and they rely on very large summer trips to balance smaller trips in the winter.

Direct costs: They are generally supportive of VMS because of safety and because it makes it easier for them to demonstrate that they have been fishing in legal areas. The volume of their business makes the costs much less of a relative burden than on smaller boats. The same is true of paying for observers but to a lesser degree because the cost of observers rises with the length of the trip.

Expected Impact of Increased Fishing Restrictions Increased regulation will lead to longer trips and increased strain on family life. Both the boats and personnel in this fleet are particularly well suited to moving overseas and this trend will accelerate. There would be some effect on the broader community through a reduction in the volume of swordfish being processed and some demand for maintenance and supply of vessels. These effects would be spread across the coast and not be significant for any one fishing community. The main buyer of distant water fleet swordfish in New Bedford has the capacity to, and presumably would, meet customers' needs through relying more on imported swordfish.

THE BLUEFIN TUNA PURSE SEINE FLEET
New Bedford MA, Gloucester MA

Alternatives The bluefin tuna purse seine fishery lasts for only a few weeks each year. The participating boats either tie up the rest of the time or they engage in alternative fisheries. These alternative activities would not be affected by changes in bluefin tuna management.

Economic Vulnerabilities The purse seine fleet's success is heavily dependent on price and hence on the value of the Japanese yen. The boats are expensive to maintain and those that tie up the rest of the year accumulate costs while they do so. This is a valuable fishery and finding crew for these vessels is not a problem, indeed many of the present crew have had their berths for many years. The fish traders to whom these vessels sell depend quite heavily on them to maintain their current profit margins. However, they report that the structure of their companies is such that there would be no lost jobs even if the purse seine bluefin tuna landings were to be significantly curtailed.

Community Support The owners and many of the crew, even some who do not reside in the community, of the four New Bedford-related purse seine vessels are integrated through kinship ties into the fishing community. The fleet enjoys the respect of the extended fishing communities in both New Bedford and Gloucester. They are generally seen to have done the most to create the bluefin tuna fishery and to still contribute a great deal to both communities.

Important Specific Measures Volume: Reduction in quota allocation and increased size limits would reduce the income of this fleet. Only if such a reduction were large would it begin to have an impact of the magnitude of price changes.

Expected Impact of Increased Fishing Restrictions Because the fleet has already adjusted to a very short season, it would continue to fish its quota unless reductions were very large. The impact of reductions in this quota on the fishing communities would not be as great as reductions

on other bluefin tuna fisheries. The effect on community attitudes would be significant because, unless such cuts were across-the-board cuts, many would see this as unfair.

THE DRIFT GILLNET SWORDFISH FLEET
New Bedford MA

Alternatives All participants in this fishery also participate in other fisheries. Respondents report that cutbacks would lead to more time not fishing and increased activity in summer flounder, squid, butterfish and whiting. New Bedford has a low high school graduation rate and a high unemployment rate. Crew forced to take time off may have a difficult time finding alternative work (but see below).

Vulnerability This fishery specializes in large, high quality swordfish that is vulnerable to price drops because of the swordfish boycott.

Community Support This fishery is prosecuted by boats with long histories in New Bedford who are very much a part of this solid fishing community. New Bedford has had considerable experience with dealing with fisheries crisis and support for fishers is very strong. In some cases, other businesses in the community have made allowances for the vagaries of fishing by employing fishers temporarily. Many fishers have also managed to get by being self employed.

Important Specific Measures Volume: Prohibition of gillnet gear for directed tuna, shark, and swordfish fishing would eliminate the fishery.
Flexibility: Closed areas should not have a major impact as respondents report that most of the fishing is already in deeper waters.
Direct Costs: Requiring acoustic deterrents and VMS will impose costs but at a magnitude the fleet could absorb. The fleet has shown willingness to participate in developing acoustic deterrents for marine mammals.

Expected Impact of Increased Fishing Restrictions Elimination of fishing for swordfish would lead to increased activity in fisheries that are further away leading to longer, sometime much longer trips. This will place increased strain on family life. Some of the alternative fisheries are also traditionally New Jersey and Virginia fisheries and this will lead to crowding and gear conflicts. Elimination will also lead to fishers having to find more temporary work while boats are tied up. The impact on the larger community of 12 boats doing less fishing and fishing for extended periods in distant waters will be economically significant, especially in light of cutbacks of other New Bedford fisheries.

RECREATIONAL FISHING IN GENERAL

Proposals for increased recreational permitting and mandatory record keeping are one set of measures that receive similar responses from recreational fishers throughout the study. The reaction to increased record keeping and reporting is that it would be a nuisance, with some fishers more willing to put up with the nuisance than others. Several fishers express distrust of

fisheries managers to use the data correctly. Several others say that they would like to see an accounting of how permit money is used before paying for increased permitting. Neither the nuisance factors, the costs of the permits relative to other costs of off-shore billfish and highly migratory species fishing, nor the questions about the legitimacy of these measures rise to the level of a community impact.

RECREATIONAL BLUEFIN TUNA FISHING

Hatteras NC, Brielle NJ, New Bedford MA and Gloucester MA

We include in this section the general category bluefin tuna fishery. Many would argue, with good reason, that this fishery is a commercial one because it allows the sale of the fish. From a social rather than legal standpoint, however, we feel that this fishery as it is currently pursued in Gloucester is better understood as a recreational fishery. In terms of the types of boats that most participants use, the degree to which participants rely on selling fish for their overall livelihood, and the auxiliary industries that are most affected, the fishery resembles a recreational fishery more closely than it does a commercial one. For the majority of boats, the social affect of the sale of a bluefin tuna is much closer to that of winning a prize in a fishing tournament than making a living from selling a fish. We recognize that there are many professional fishers who participate in this fishery to catch fish to sell. We also recognize that for the fish dealers, the fish they buy from small private boats are often of lower quality than those they buy from full-time commercial fishermen. The main social impacts that arise from regulating this fishery, however, are of a recreational type. This is especially true given the current decrease in prices.

Alternatives

The recreational fishing industry in these communities is a highly diverse one. This has moved beyond simply having different fish available for fishing. It includes different sorts of fishing experiences aimed at different groups. A particularly important distinction is between families with children and adult fishing parties. There is an overall trend toward more interest in providing an overall fishing experience that people want to repeat and less in bringing in "meat," but this trend in no way means that landing fish is no longer important. Bluefin fishing is an experience of adventure and the prize is an important aspect of that adventure. This is especially so when, as often happens, the event of landing the fish brings with it both the attention of the community and a substantial amount of meat or money. The bluefin tuna fishing experience is not, in itself, a family activity but it is often the attraction that brings an adult, and hence the rest of the family, to the community. It attracts experienced amateur fishers as well as adventure seekers who are often outdoors enthusiast in other arenas. With the exception of marlin, it attracts wealthier people than the other species available in these communities. Alternatives for these communities will always be recreational fishing for other species. These other species, again with the partial (because marlin is usually released) exception of marlin where available, cannot replace the added adventure of fishing off shore for bluefin tuna.

Vulnerability

Recreational fishing in these communities drives a much larger economy. This includes both the marine trades (tackle, boats, engines etc.), fishing supplies such as bait and ice, and general

tourist services such as restaurants and hotels. These communities are competing with many other possible tourist destinations and this increases their dependence on large, well-known fish that act as prominent attractions. As a leisure activity, recreational fishing is very sensitive to changes in the overall economy, and this fact increases the importance of fisheries that attract wealthier people. Important vulnerabilities stem from the seasonal nature of recreational fishing in these communities. Of the three, Hatteras is the most isolated and experiences the greatest change between seasons. Seasonality makes business planning, and finding, training, and keeping employees, more difficult. It often means high winter unemployment. What these communities depend on is not fish. What they depend on is the expectation in the minds of potential customers that they will have a reasonable chance to land a fish. They need this expectation to last for as long a season as possible and at times, such as summer and weekends, when people are likely to be able to travel. New Bedford's recreational fishing community is small and the offshore component is minimal.

Community Support

All three of these communities are fishing communities with long and rich histories. They are mixed recreational and commercial fishing communities. While there are tensions growing between these sectors, they understand themselves to be parts of the same community. Many people shift between or provide services to both of them. Outsiders are increasingly moving into the industry and this has also been a source of tension. Recreational fishing organizations are very common. New Jersey and Massachusetts both have well organized and represented recreational fishing interests. On the whole these communities, particularly Gloucester, New Bedford, and Brielle are able to work together to respond to changes.

Important Specific Measures

Volume: Increased size limits for giant tuna would allocate more of the fishery to northern areas. Increased size limits for school tuna would continue and accelerate the ongoing loss Brielle's ability to use bluefin tuna to attract customers.

Flexibility: Season opening dates are also essentially an allocation measure in this fishery. The positive impact on one community will mean a negative impact on another. It should be recognized that, because the crucial variable we are dealing with is the expectation of landing a fish rather than actually landing a fish, this relationship is non-linear. In other words, as long as there are enough fish off a community so that people think they might land one then adding a few more fish from another community will make very little economic difference. Adding enough fish to change people's minds about these expectations, on the other hand, will make a far greater difference than the actual number of fish. The pattern of the use of restricted fishing days in the general category makes a great deal of difference in Massachusetts. In Gloucester, weekend openings bring in much more revenue, but there is also a decrease in safety because of crowding. The presence of more amateur boats also makes it more difficult for professional fishers to catch fish. They also encourage vacationers to go elsewhere, rather than find other more local activities, during the longer section of closed days. Continuous days also cause a decrease in tackle sales. Continuous days help fishers from New Bedford because it gives them more steaming and fishing time. It is very important that businesses know as far ahead of time as possible the schedule of restricted days.

Expected Impact of Increased Fishing Restrictions
Increased bluefin tuna size limits will have a negative impact on the recreational fishing business in Hatteras and Brielle, while having little or no effect on Gloucester or New Bedford.

RECREATIONAL SHARK FISHING

Panama City FL, Madeira Beach FL, Brielle NJ, New Bedford MA, Gloucester MA

Alternatives
Shark fishing is comparatively less important to recreational fishing in these communities than billfish or bluefin tuna. In some cases, this is a direct result of a decline in stock size. Panama City and Brielle have both canceled a traditional shark tournament because of concern for the stock. Two recent shark tournaments in New Jersey did not catch a single legal size mako shark. Sharks play an important role in the fishing industry, similar to other large fish, of attracting customers with the cachet of "Jaws." The tackle used for shark is also expensive and profitable. As with all recreational communities, the alternative is to fish for other fish, but a few customers are attracted by shark in particular.

Vulnerability
The general vulnerabilities of recreational fishing communities were discussed above under recreational bluefin tuna. Shark fishing used to be important in Panama City and Brielle and is no longer making a contribution because of a decline in the stock. Of these two, Brielle is the more vulnerable because of the decline of its traditional tuna fishery. Shark fishing is now almost always catch and release because of regulations, variety in the taste of the meat, and a growing catch and release ethic in the face of declining stock. The recreational fisheries of Panama City, Madeira Beach and Gloucester are doing very well and problems in shark fishing will make little overall difference. Brielle is being strongly affected by a decrease in its historical tuna fishery (see the discussion of recreational bluefin tuna above) and is therefore more vulnerable to negative impacts from a decrease in shark fishing. New Bedford's recreational fishing community is small and the offshore component is minimal.

Community Support
The recreational fishing communities in all of these ports are fairly well developed, although New Bedford's is very small, especially in comparison with commercial fishing activities. There are few "shark specialists" among the recreational fishers. Tension and distance between the recreational and commercial fishing communities is higher in the Florida communities than in the others, but recreational fishers throughout believe that commercial fishing is to blame for the loss of the shark.

Important Specific Measures
Volume: The recreational bag limits being considered would have little affect on these communities because they already fishing the shark more conservatively than these regulations propose.

Expected Impact of Increased Fishing Restrictions
The proposed measures would have no negative impact on these communities considered from the recreational side. A recovery of the shark fishery would have a significant positive affect.

RECREATIONAL BILLFISH FISHING

Venice LA, Panama City FL, Madeira Beach FL, Islamorada FL, Pompano Beach FL, Arecibo PR, Hatteras NC

Alternatives
Billfishes play an important role for these communities very similar to that described for bluefin tuna above. They are an adventure fish attract fishers and their families to the communities. This is an expensive fisheries with expensive gears and it attracts wealthier customers than inshore fishing. Billfish tournaments are very important, not just as revenue generators for both business and charity, but as community social events. Many recreational fishers are very passionate about and committed to billfish fishing. Even more than is true for the highly migratory fishes, there is no alternative fish that can play the role that billfish plays in the recreational community. Billfish are the primary symbol of marine recreational fishing.

Vulnerability
The general vulnerabilities of recreational fishing communities were discussed above under recreational bluefin tuna. South of Hatteras seasonality becomes somewhat less important but no community is completely free of seasonal effects. The dependence of these communities on billfish is related in a complex way to the number of billfish available to be caught. The one or two billfish awarded prizes at a tournament can be indirectly worth hundreds of thousands of dollars to the community. The relationship of the value of these one or two tournament fish to the stock size is also complex. Smaller billfish stock sizes may have the effect of increasing participation in tournaments. The structure of prize payoffs can make a the prize fish of a tournament that catches no other fish worth a great deal of money because it wins multiple prizes. A smaller stock also increases the perceived importance of luck over fishing skill. These two factors taken together make the tournament more attractive to unskilled fishers, who are the overwhelming majority of potential participants. Once again, what is important is the expectation in the customers mind that there is a chance of catching a fish. In the case of marlins, the possibility of catching the fish is so attractive that customers will buy the fishing experience with a comparatively low expectation of catching the fish. This is not to say that having more fish available to the community is not better than less fish, especially since the community is competing with other billfish fishing destinations. What it does mean is that a community that is able to offer other recreational fishing experiences can continue to benefit from a relatively small billfish stock size. Except in Arecibo, in none of these communities is marlin fishing a relatively large component of recreational fishing effort. In the Florida communities the local billfish anglers, as opposed to tourist anglers, are also very important. These are generally very committed anglers who spend a great deal of money on their hobby. Outside of tournaments, billfish fishing is almost entirely catch and release. The significant exception is Arecibo where recreational fishers openly sell marlins.

Community Support
The recreational fishing sectors in these communities are large and tournaments and other community events create a community feeling among participants. Except for Hatteras, none of these ports are integrated fishing communities where the commercial and recreational components see themselves as part of the same social network. In Florida and Louisiana the recreational and commercial groups tend to be hostile to one another and interact rarely. The recreational fishers blame the commercial fishers, particularly longliners, for the decrease in fish stocks.

Important Specific Measures
Volume: Most proposed recreational billfish measures are less conservative than existing fishing behavior. The main exception to this is requiring catch and release format for all tournaments. Except in South Florida, where marlin tournaments are relatively less important than sailfish tournaments, this would have a significant impact on participation in billfish tournaments. Even in areas such as Madeira Beach, where a tournament catch and release ethic is making headway, the idea is still strongly resisted by a significant portion of the fishing public.

Expected Impact of Increased Fishing Restrictions
Aside from the catch and release tournament format discussed above, there are no negative impacts on these communities of the proposed restrictions. Recovery of the stock would have the important positive impact of allowing US billfishing destinations to once again compete with foreign billfishing destinations.

THE PUERTO RICAN DEEP WATER ARTISANAL FISHERY
Aguadilla PR, Acrecibo PR

Alternatives
The artisanal fishery on the northwest coast of Puerto Rico, which targets mainly tuna and dolphin, does not play a significant role in the overall economy of these communities. These are small scale fishers selling their fish to individuals and local kiosks. Even local restaurants mainly use fish trucked in to the communities. Very deep water is found close to the coast in this part of the island and, as a result, this fishery has a billfish bycatch. Any marlins caught as bycatch are sold along with the rest of the catch. Most inshore fish stocks in Puerto Rico have been badly overfished and are declining. Sharks have also become a much rarer part of the catch.

Vulnerability
These are very poor fishers living in communities with very high unemployment, literacy, and numbers of public assistance recipients. Fishing is their livelihood, with public assistance being a likely second option. They receive assistance from the government in the form of facilities to clean and sell their fish.

Community Support
Seafood plays an important cultural role in these communities but the artisanal fishery is not integrated into the rest of the economy. In fact, there has been considerable friction between the

artisanal fishers and tourist-oriented sea side development. The fishers are organized into government sponsored fisheries development organizations that are administered by a different department than the one responsible for fisheries management. Fisheries management has a serious legitimacy problem with these fishers and restrictions on marlin size limits and sales are ignored.

Important Specific Measures
If existing restrictions on marlin size limits and sales were enforced the result would be a loss of income for an already very poor population.

Expected Impact of Increased Fishing Restrictions
The new measures being considered will have no impact beyond the existing measures.

MITIGATING MEASURES

Mitigating measures in social impact assessments are usually understood as additional things that an entity creating a disturbance in a community will do to reduce that disturbance. In the present case, we are dealing with an agency that is promulgating rules and which has little ability to take other types of actions to "mitigate" the effects of the rule making. Furthermore, all of these rules are meant to be produced by a public, participatory process in which it is political give and take between the stakeholder groups that gives them form. In this context, we feel that our role in suggesting "mitigating measures" should be to highlight areas of discussion where consideration of social realities in the rule making process could result in a more balanced and effective set of rules.

Measures Affecting the Longline Fleet

The global longline fleet will be the major source of fishing pressure on highly migratory species for the foreseeable future. There is a strong trend toward reducing American participation in this fleet. We feel that the implications for the conservation interest of the United States of being a minor participant in commercial fishing for highly migratory species is a question that should be seriously examined.

Aside from the artisanal fishery in Puerto Rico, the most vulnerable group we have described is those members of the longline fleet who have not been able to participate in the global expansion of the longline business. One measure that should be considered is to exempt the smaller (e.g. < 60') longline boats from measures such as VMS and observers that impose direct costs on their operations. Another would be to avoid the imposition of measures beyond quotas, such as limits on soak time and gear length, that would reduce the flexibility of the fishing operations. Finally, counting unsold fish against a quota is an indirect means of reducing that quota, one which would have little effect on fishing operations. Markets impose restrictions as well. HMS fishers rarely have an economic incentive to intentionally target small fish. Another option would be counting the unsold fish but reinstating a size limit tolerance.

Recreational Measures

Not all fish have the same economic value. The fish that are used to determine tournament prizes in large HMS and billfish tournaments, and which set national and world records, can literally be worth hundreds of thousands of dollars to the community. Their value lies not in the catching of the fish, but in attracting all those who seek to catch the fish. These fish could be given special status. It would be reasonable to exempt them from regulations entirely. Tournament participants have little incentive to keep small fish. If sizes of prize-potential fish were relayed to all participants when they were caught, as is already done in some tournaments, then the tournament could avoid catching many smaller fish to determine the winners. World and national record fish are rare enough events so that their exemption from regulation would also have no impact on the stock. The exemption would be restricted to record fish that were recognized as such when they were caught. The embarrassment that would accompany declaring a fish to be a record fish by mistake would keep abuse of such an exemption to a minimum.

Many recreational measures are unavoidably allocative in effect. While we know of no existing method for doing this, with further research it may be possible to determine thresholds below which the attractiveness of a community as a fishing destination is severely diminished and above which the gains for additional fish are substantially less. Such thresholds could then be the basis of fairer allocation decisions.

*The Drift Gillnet Flee*t

Because of the extent to which the New Bedford area has had to deal with problems of diminished fisheries, ways should be found to avoid the elimination of the drift gillnet fleet. Focus should be placed on ways to make this fishery cleaner rather than banning it altogether.

The Puerto Rican Deep Water Artisanal Fishery

This is a very small fishery. It is unrealistic to expecting a small-scale artisanal fisher to throw back a marlin that he has just used substantial time and energy to bring to his boat. This is especially true in a cultural context where catching and selling marlin is normal and accepted. This problem is currently dealt with by ignoring it, but ignoring it only contributes to an overall contempt for fisheries managers and management in a context where many artisanal stocks are in decline. Recognizing this fishery and assigning it a small quota will not change the number of marlins being killed, but it may begin to show these fishers that management can be responsive to their needs.

CHAPTER 3 - MASSACHUSETTS

STATE PROFILE

Demographic and Economic Characteristics
The population for Massachusetts in the 1990 Census is 6,016,425 residents. The educational attainment in Massachusetts is such that nearly 80% of the residents 25 and older are high school graduates. The unemployment rate in this state is 6.7% of the civilian labor force. Industries that are important sources of employment include *retail* (employing 16% of the working residents), *manufacturing durable goods* (12%), and *health services* (10%); *agriculture forestry and fisheries* industries only employ approximately 1% of the working population of Massachusetts. The per capita income of Massachusetts for 1989 is $17,224.

Fisheries Characteristics

Bluefin Tuna The landings for bluefin tuna in Massachusetts in 1996 totaled 1,485,666 pounds; these landings accounted for over 70% of the total bluefin tuna landings in the Atlantic and Gulf States in 1996. The value of these landings for Massachusetts in 1996 was $13,016,964 which represents nearly 78% of the total economic value of the landings of bluefin tuna in the Atlantic and Gulf states in 1996.

Swordfish The 1996 landings of swordfish in Massachusetts totaled 1,143,634 pounds; these landings accounted for 23% of the total swordfish landings in the Atlantic and Gulf states in 1996. The value of these landings was $3,428,561 which represents 22% of the total economic value of swordfish landings in the Atlantic and Gulf states for 1996 (NMFS).

Large Coastal Sharks The Massachusetts landings of large coastal sharks in 1996 totaled 80,862 pounds. These landings had a dollar value of $68,842 (NMFS).

Recreational Fishery In 1996, there were 429 saltwater anglers in Massachusetts; these anglers account for approximately 5% of the total number of saltwater anglers in the United States that year. Seventy-four percent of those anglers were residents of Massachusetts and 26% were nonresidents. There were days of saltwater fishing in 3,953 in 1996; these days accounted for nearly 4% of the total days of saltwater fishing in the United States that year. Eighty-five percent of those days were by residents of Massachusetts and 15% were by nonresidents (FWS, 1997).

In 1996, expenditures by saltwater anglers in Massachusetts totaled $221,680,025; this accounted for nearly 3% of the total U.S. expenditures by saltwater anglers that year. Saltwater fishing in Massachusetts had an economic output of $424,631,426 (1.7% of the U.S. total), generated wages and salaries of $119,005,086 (1.7%) and created 4,957 jobs (1.7%) (ASA, 1997).

MAJOR HMS FISHING COMMUNITIES

Demographic Characteristics

The communities in Massachusetts likely to be affected by Fishery Management Plans are found in Table 3.1. There are eleven communities whose population sizes range from that of Boston, at 574,283 residents, to Green Harbor with 2,205. All of the communities have gender compositions which indicate a greater population of female residents to male residents; Provincetown has the most even gender ratio of men to women. Age composition regarding the group from 15 to 44 years of age ranges from 57% of the population in Boston, to 31% in Chatham. Married family households are dominant in the communities of Sandwich (69% of all households) and Green Harbor (64%), but are much less prevalent in the larger towns, such as Boston (31%) and Provincetown (27%). School enrollment is highest in Boston, and much lower in Chatham and Provincetown.

Economic Characteristics

New Bedford and Provincetown have the largest unemployment rates, at 12.2% and 17.6%, respectively. At 4.4%, both Chatham and Sandwich have the lowest unemployment rates. The most favorable incomes per capita are in Nantucket ($21,139) and Newburyport ($19,008). Fairhaven and New Bedford have the lowest incomes per capita for 1989, $13,114 and $10,923, respectively; this is an important point, since the communities of Fairhaven and New Bedford lie just across the water from one another.

The role of the fishing industry as an employer of the community's residents is strongest in Chatham, where it employs nearly 10% of the community's workers. In Boston, Green Harbor, and Newburyport, the fishing industry supplies jobs to less than 1% of the community's workers. The remaining communities have fishing industries with employment ranging from 2.9 to 4.3% of workers.

Fisheries Characteristics

Table 3.2 gives 1996 landings and permit information for the communities in Massachusetts likely to be affected by Fishery Management Plans.

Bluefin Tuna Of the top communities in bluefin tuna landings and permits in Massachusetts for 1996, Gloucester not only landed the greatest quantity of bluefin tuna, 439,114 pounds (dry weight), this community also has the greatest number of commercial and recreational tuna permits for Massachusetts, with 401 and 12 permits, respectively. New Bedford and Green Harbor are also important bluefin tuna landings communities. Newburyport and Chatham follow Gloucester as having large numbers of commercial tuna permits; Boston and Newburyport are top ports in recreational tuna permits.

Swordfish Only five communities in Massachusetts have landings of swordfish for 1996. The top communities in swordfish landings are Fairhaven, New Bedford and Boston; all three communities had landings over 300 pounds (dry weight).

Large Coastal Sharks Only two communities in Massachusetts have landings of large coastal sharks for 1996 - New Bedford with 200 pounds (dry weight) and Newburyport with 10 pounds (dry weight).

TABLE 3.1
MASSACHUSETTS COMMUNITIES AFFECTED BY FISHERY MANAGEMENT PLANS
DEMOGRAPHIC CHARACTERISTICS
Source: U.S. Bureau of the Census

Community	1990 Census Population	Sex Ratio M/F	% Married Family Households	% of High School Graduates Age 25 and over	Civil Unemployment Rate	1989 Per Capita Income	% Agriculture, Forestry & Fishing Industry
Boston	574,283	0.91	31.2	75.7	8.3	$15,581	0.5
Chatham	6,579	0.86	52.7		4.4	$18,471	9.8
Harwich/Harwich Port	10,275	0.87	58.7	87.8	9.0	$15,020	3.4
Fairhaven	16,132	0.93	59.1	68.2	7.6	$13,114	2.9
New Bedford	99,922	0.88	49.7	49.7	12.2	$10,923	3.2
Gloucester	28,716	0.93	52.2	75.6	6.8	$16,044	3.8
Green Harbor	2,205	0.95	64.4	96.1	6.4	$16,944	0.7
Nantucket	3,069	0.93	45.7	90.4	1.8	$21,139	4.3
Newburyport	16,317	0.89	50.8	85.3	6.0	$19,008	0.6
Provincetown	3,561	0.97	27.2	82.0	17.6	$14,955	4.3
Sandwich	15,489	0.97	68.9		4.4	$17,412	3.4

TABLE 3.2
MASSACHUSETTS COMMUNITIES AFFECTED BY FISHERY MANAGEMENT PLANS
FISHERIES CHARACTERISTICS
Source: NMFS

Community	Bluefin Tuna Landings *dry wt in lbs*	Bluefin Tuna Landings *rank*	Commercial Tuna Permits *number*	Commercial Tuna Permits *rank*	Recreational Tuna Permits *number*	Recreational Tuna Permits *rank*	Swordfish Landings *# of fish*	Swordfish Landings *rank*	LC Shark Landings *# of fish*	LC Shark Landings *rank*
Boston	2,915		114	6	11	2	327	3		
Chatham	42,202	9	169	3	3					
Harwich	107,391	4	98	9	1					
Fairhaven	4,198		36		6	5	618	1		
New Bedford	268,479	2	122	5	2		443	2	200	1
Gloucester	439,114	1	401	1	12	1	32	4		
Green Harbor	122,385	3	101	7	2					
Nantucket	2,802		46		7	4				
Newburyport	64,667	6	176	2	8	3	1	5	10	2
Provincetown	57,834	7	126	4	4	10				
Sandwich	104,530	5	71		1					

GLOUCESTER COMMUNITY PROFILE

Gloucester is found on Cape Ann, which is located in northeastern Massachusetts, approximately thirty miles from Boston. One of the earliest American settlements, Gloucester also earns its distinction as the oldest American seaport. In fact, before settlement, European vessels fishing the waters off Cape Ann for cod in the summer (NOAA, 1996). Today, Gloucester remains one of the top ports in the Eastern United States.

Gloucester offers a diverse community consisting of working class and ethnic populations, as well as generations of wealthy families and summer tourists. A prominent feature of Gloucester is the artist population in Rocky Neck, a small peninsula located across the harbor on Cape Ann; Rocky Neck is one of the United States oldest art colonies (Gortons, 1998). The Cape Ann Symphony and the Gloucester Theater Company are also prominent in Gloucester culture. Aside from the commercial fishing fleet, the working waterfront is the site of important economic activity; in recognition of its importance, the city strives to prevent residential development along the waterfront (Gloucester Narrative, 1998). Whale watching is also an important marine related industry; Gloucester is one of the few seaport towns in the United States where whales come so close to shore (Gortons, 1998).

DEMOGRAPHIC PROFILE

Population

The population of Gloucester is 28,716, as reported in the 1990 Census. Population estimates for 1996 show about a 5% increase since 1990. According to the 1990 Census, men and women accounted for 48% and 52% of this population, respectively.

Racial and Ethnic Composition

A look at the racial composition of Gloucester reveals a racially homogeneous population. The population is 99.4% Caucasian, with relatively low counts of African-American, Asian and American Indian race populations.

The dominant cases of single ancestry in Gloucester are Italian (14.0% of the population), English (7.0%), Irish (6.3%) and Portuguese (6.4%). While both the Portuguese and Italian populations are active in the fishing fleet of Gloucester, the groundfish fishery is dominated by Italians and Sicilians. While ethnicity is often cited as a major difference when comparing the fishing communities of Gloucester and New Bedford, it is often merely one factor among many linked to the characteristics and history of each region (Hall-Arber, 1996). When compared to the Portuguese fishing families of New Bedford, Sicilian community has not maintained as strong of ties to their ancestral country.

Age Structure

The 1990 Census shows that in Gloucester, 46% of the population are age fifteen through forty-four. Eighteen percent of the population is under fifteen while the remaining 36% are above

forty-four; approximately twice as many persons over forty-four as compared to those under eighteen suggests an aging populace.

Marriage
According to the 1990 Census, approximately 56% of the population of Gloucester 15 years and older are presently married. Twenty-seven percent have never been married, 8% are divorced and 9% are widowed. Of those who are widowed, 82% are women and only 18% are men.

Household Composition
In Gloucester, there are a total of 11,550 households with average of 2.47 persons per household. Over half of those households contain married couple families; nearly a quarter of all households contain married couple families with children under eighteen. The number of female householders with children and no husband present are six times more prevalent than male householders with children and no wife present. Thirty four percent of the households in Gloucester are non-family households. Over a quarter of the householders in Gloucester are over age sixty-five. Table 3.3 shows some features of Gloucester's household composition.

TABLE 3.3
HOUSEHOLD COMPOSITION
GLOUCESTER, MA
Source: U.S. Bureau of the Census

Total Number of Households	11,550
Average Number of Persons per Household	2.46
Percent of Married-couple Family Households	52.2
Percent with own children under 18	23.0
Percent of Male Householder Family Households	2.6
Percent with own children under 18	0.9
Percent of Female Householder Family Households	11.3
Percent with own children under 18	5.4
Percent of Non-family Households	33.9
Percent of Householders Sixty-five or older	25.9

Of the 13,125 housing units in Gloucester, 88% are occupied and 12% are vacant. Of the occupied housing units, 58% are owner-occupied and 42% are renter-occupied. Of the vacant housing units, 23% are available for rent and 9% are available for sale. Over half of the vacant housing units (53%) are used for seasonal or recreational use. Table 3.4 gives additional housing information for Gloucester.

TABLE 3.4 HOUSING INFORMATION GLOUCESTER, MA Source: U.S. Bureau of the Census	
Total Housing Units	13,125
Owner-occupied Units	6,687
Median Value	$177,100
Renter-occupied Units	4,892
Median Contract Rent	$501
Vacant Housing Units	1,546
Housing Units Vacant for Seasonal Use	824

Educational Trends

In Gloucester, school enrollment is approximately 22% of the population three years and over. Of people 25 years and older, 75.5% are high school graduates. In Gloucester, fishermen often finish formal schooling by the time they reach fifteen; this is especially true for those fishermen who are immigrants (Hall-Arber, 1996). Table 3.5 shows the educational attainment for the residents of Gloucester according to the 1990 Census.

TABLE 3.5 EDUCATIONAL ATTAINMENT (PERSONS 25 YEARS AND OLDER) GLOUCESTER, MA Source: U.S. Bureau of the Census		
	# of Persons	% of Population 25 and over
Less than 9th grade	1,701	8.5
9th to 12th grade, no diploma	3,179	16.0
High school graduate (includes equivalency)	6,315	31.6
Some college, no degree	3,051	15.3
Associate degree	1,642	8.2
Bachelor's degree	2,700	13.5
Graduate or professional degree	1,382	6.9

Fishing Related Associations

One of the most prominent fishing association in Gloucester is the Gloucester Fishermen's Wives Association (GFWA). This wives association, established in the late 1960s, offers support to the fishing and seafood industry.

Economic Characteristics

Income The per capita income reported for Gloucester in the 1990 Census is $16,044; this is considerably higher than the per capita income for New Bedford ($10,923), although fishermen's incomes in Gloucester tend to be lower than those of New Bedford fishermen (Hall-Arber, 1996).

Employment According to the 1990 Census, the unemployment rate in Gloucester is 6.8% of the labor force. Of the employed labor force, less than one percent are in the armed forces. In the civilian employed population, 53% are men and 47% are women. Thirty-three percent of the population over 16 do not participate in the labor force.

Seventy-three percent of the employed population of Gloucester work as wage or salary earners in private, for-profit companies. Approximately 10% of Gloucester's employed population are government workers. Eight percent of Gloucester's workers are self-employed.

Managerial/ professional (27%) and *technicians/ administrative* (28%) occupations are most frequently reported occupations by Gloucester's employed population. *Farming, forestry and fishing* occupations account for 2.8% of the occupations in Gloucester

Employment by Industry The industries in Gloucester that employ the greatest number of workers are the *Manufacturing* (durable and nondurable goods - 22%), *Professional and related services* (22%) and Retail (16%) sectors. Less than 4% of the employed population, or 548 employees, in Gloucester work in the *agriculture, forestry, and fisheries* industry sector. Table 3.6 shows the role of industry in employment of Gloucester workers according to the 1990 Census.

TABLE 3.6
EMPLOYMENT BY INDUSTRY
(PERSONS 16 YEARS AND OVER)
GLOUCESTER, MA
Source: U.S. Bureau of the Census

Sector	# Employed	% Employed
Agriculture, forestry, and fisheries	**548**	**3.8**
Mining	11	<0.1
Construction	790	5.5
Manufacturing, nondurable goods	1,462	10.1
Manufacturing, durable goods	1,742	12.0
Transportation	746	5.2
Communications and other public utilities	249	1.7
Wholesale trade	687	4.7
Retail trade	2,338	16.2
Finance, insurance, and real estate	751	5.2
Business and repair services	748	5.2
Personal services	446	3.1
Entertainment and recreation services	202	1.4
Professional and related services	3,242	22.4
Public administration	508	3.5
Total	14,470	100

Fishing Related Business When support industries such as ice companies and seafood dealers are taken into consideration, 40% of Gloucester's economy is based on fishing (Hall-Arber, 1996). Attempts to diversify within as well as outside the fishing industry has given Gloucester "optimism" towards its economic future. Not content to serve as a bedroom community, a status attained by its proximity to Boston, Gloucester is encouraging development in the light manufacturing and tourism industries as well as projects such as added value and marketing of seafood.

FISHERIES PROFILE

Before settlement, European vessels fished the waters off Cape Ann for cod in the summer (NOAA, 1996); in fact, for centuries dried cod was a major export for Gloucester. Gloucester is known as the oldest American seaport, established as such 372 years ago. Today, year round groundfishing is the dominant fishing activity; though not as prominent, inshore lobstering is also a major fishing activity in Gloucester (NOAA, 1996).

Private boats fishing for the Bluefin tuna in Gloucester participate in a fishery that defies normal categorization. These fishers have general category permits which make it possible for these fishers to sell their catch, a technically "commercial" transaction. They are also joined in this fishery by a number of professional commercial fishers whose main interest is catching fish to sell. There is some tension between the two because the professionals would rather not have to try to fish in the same waters with all the "wahoos."

The social organization of the fishery, however, is basically recreational. The private boats are full of people who are on vacation for their regular occupation. They catch few fish. One respondent said "If you get one a season you are happy." The fish is expensive enough so that catching even one is a big help in reducing expenses. For these private sport fishers, however, the social role of selling the fish is much closer to winning a trophy in a tournament than making a living. This respondent, who has been involved in the private boat fishery for years, continues her description: "There are guys that fish everyday and get none. It is a big rush to catch them. They are beautiful, multicolored creatures. You get a rush when they hit a line. Then you have to do many things at once, lots of tension. You have to pull in the other reels, get the anchor up and move the boat. You have to make sure the line does not go under the boat. It is very easy to lose the fish. Early in the season everyone is friendly but by August people are angry. Back at the bar everything is a big secret. There is a lot of information exchange going on. Groups are formed. People use secret channels on their radios. Lots of talking and passing out disinformation. If five fish are caught there are five versions of how each one was caught. The real attraction is the rush getting the fish. On an open day if you come in early it is because you have a fish. The whole marina knows. It is really cool and you take a lot of pictures. Then you have to clean the fish and shop it around to sell it." Gloucester used to have a Bluefin tuna tournament organized by the largest of the recreationally-oriented marinas. They felt that the fish is not predicable enough for a tournament, and the last one was four years ago.

Most recreational fishing tourists that come to Gloucester are from the Northeast. There are people who want to go for sharks because they are big, thrilling fish but one respondent estimated that three times as many people come for Bluefin tuna than for sharks. The recreational shark is a catch and release fishery. About sixty percent of the 300 year round boats at the largest marina have general category permits and about 40% do not. During the Bluefin tuna season thirty to fifty boats will come just for the season, while generally that many of the non-tuna fishing boats find the Bluefin tuna season a congenial time to go elsewhere. Many of the people that come for the season are on family vacations as well as fishing. Bluefin tuna fishing is not a family activity. Fathers go alone and the family will go to the beach or do visit other tourist attractions. This adds to the community-wide economic benefits that come from the recreational Bluefin tuna fishery. Many of the year round non-tuna fishing boats remain during the season and, because the bluefin tuna season is in the summer, there are also many tourists who bring their boats to Gloucester at this time without being interested in the fishery. This had causes conflict. The family boats are in the same harbor as the BFT boats that leave at 3:00 am. Marinas try to deal with this by concentrating the most serious tuna boats on one dock.

The Gloucester charter fleet is about 15 boats in two marinas. Most of the Gloucester charter captains work at other jobs during the off season. Many are teachers. The earliest charter fishing starts in April for cod mackerel, haddock and pollock. Bass starts late May and is good all summer, as is offshore cod fishing. There are a few other minor species. Finding reliable mates is an ongoing problem. Newspaper adds get a lot of applications from commercial fishers and some are hired. The fleet has seen a number of problems with drinking, drugs and generally young, unreliable crew.

The charter fleet follows a standard policy that when bluefin tuna are caught the fish belongs to the boat and the charter for the day is free. The really serious customers look for tuna. There is a low probability that they will catch them. "But if they do they won't forget it." said one captain. The charter captain often discourage customers from an bluefin tuna charter. This captain tells them: "Tuna charters are boring, you have to throw bait, maybe even cut bait, you have to do what you are told, reel like crazy when you are told, you will be yelled at, and in the end the boat will keep the fish." Very often when the general category is open, charter captains will take an extra mate and fish for bluefin tuna without a charter. They feel that having no amateurs on board greatly enhances their chances of actually landing a fish.

There is a small fleet of vessels in Gloucester that harpoon bluefin tuna. Three vessels owned by residents landed bluefin tuna using this gears in 1997. Two did so under a general category permit and the third did so under a harpoon permit. Our respondent from this fleet fishes for lobsters, and is a house painter, in addition to harpooning bluefin tuna. The Gloucester harpoon fleet was never big, ten vessels when it started. The category has evolved to where the fish are mainly caught by a small number of few boats that use spotter planes. None of the boats with planes live in Gloucester. This was the reason that the two Gloucester harpooners shifted to general category. They could not compete with the spotter planes for the harpoon category quota. These harpooners usually take 2-3 crew. The respondent reported that years ago people would have been lined up to go harpooning but now it is hard to find people because, there is no guarantee of a catch.

Of the three retail tackle shops in Gloucester, only one specializes in offshore fishing. At that store 85% of the business is related bluefin tuna fishing, both commercial and recreational. When the season is open for two weeks in the summer the shop is very busy. Then business will slow down until about five days before the September opening and it get really busy again. Most of the customers are from out of town. Restricted fishing days are good for his business. People come in to buy supplies and do repairs when they would otherwise just carry on fishing. Bluefin tuna gear is very expensive. The reels cost $800-1000 and are useful for shark and bluefin only. People tend to want the highest quality gear when they are going after bluefin tuna and few people seem concerned about price. The tackle shop works on bluefin tuna gear all year. In winter they repair and build rods. Shark is also important. The shark recreational fishery has its own set of equipment. It is smaller than bluefin tuna but people still want top quality.

Bluefin tuna dealers in Gloucester deal with a large number of boats of various types. From private sport fishers to one purse seine vessel that sells its catch in Gloucester. Most of the fish

are sold on consignment, so that the boat is taking the risk. Some dealers will give a minimum guarantee on fish they take on consignment. Personal networks are very important in bluefin tuna dealing and competition can be very fierce. During the bluefin tuna season transient dealers appear in Gloucester. One respondent estimates that 12-15 dealer come from outside. Many of these do not last but even established dealers go under. The largest dealer buys from the purse seine because they are the one of the few dealers that are able to finance the transaction. This business has only one steady employee and hires up to seven people during the season. These are usually fishers from the commercial boats who can't get work. They are very adept at cleaning and processing the fish and this is important when handling all the fish from a purse seiner.

One specific conflict between the recreational and commercial bluefin tuna fishers in Gloucester is that the "weekend warriors" fuel the recreational economy. The commercial fishers, however, prefer that the closures be on the weekends because of the problems associated with crowding boats run by amateur fishers.

The closure of the bluefin tuna quota has a dramatic affect on Gloucester's economy. Many recreational fishers are from out of state and they leave when the season closes. Restaurants close earlier when the season is closed. Respondents are particularly troubled by the uncertainty of not knowing when the quota will be filled or which days will be open. They get about 24 hours notice of the season closing. They make estimates based on the available schedule but they know that it will change. Having consecutive closed days also makes business planning easier.

TABLE 3.7
AVERAGE DAILY BOAT FUEL SALES AT A GLOUCESTER MARINA (US$)
Figures are from July and August 1997, "Include Lag" column includes the day before a closure in the closed category.

Status	All Days	Weekends	Weekdays	Include Lag
Open	2510 N=30	4059 N=10	1736 N=20	2747 N=24
Closed	1677 N=32	2737 N=8	1324 N=24	1650 N=38

Table 3.7 reports the affects of the closure of bluefin tuna fishing on the fuel sales at a large marina in Gloucester that serves both private and charter boats. Overall, sales on closed days average 33% less than those on open days. Clearly, other boating activities account for significantly less fuel consumption than bluefin tuna fishing. The suggestion of the importance of "weekend warriors" bluefin tuna fishers is also evident. Overall, 48% of fuel sales take place on weekends. Closures that take place on weekdays cause a 24% drop in sales, while closures on weekends cause a 33% drop in sales. Finally, people often fuel their boats the day before they

fish. If open days just before closures are counted as closed days, the affect of closures on fuel sales increases to a 40% drop.

Bluefin tuna have historically played an important cultural role in the Italian community. One respondent remembers July 15, 1970 when a recreational fishing boat came to Gloucester to find "Italian people" to whom to give a huge bluefin because they had heard that the Italians loved the meat. They landed the fish and there was a festival. Even today, when a big tuna is landed, people get very excited and uses it as an excuse for a party. This stems from Sicily where tuna also play an important cultural role. The fishers pride attaches to landing the BFT more than to any other species. Before the price rise in the 1980s they would just cut the fish up and give the meat away.

NEW BEDFORD COMMUNITY PROFILE

New Bedford is a long and narrow city along the coast of southern Massachusetts where it faces the city of Fairhaven across the water. Recently named top ten "green cities" in the country (New Bedford Narrative, 1998), New Bedford faces the problems associated with its urban setting such as low education levels and high unemployment. The working waterfront and its industry have become important economically as the manufacturing base of the city crumbles. Once the "whaling capital of the world," today New Bedford possesses one, if not the, largest fishing fleets in the eastern United States (NOAA, 1996).

DEMOGRAPHIC PROFILE

Population

For the 1990 Census, the population of New Bedford was 99,922. This population was comprised of 47% male and 53% female residents. The 1993 and 1996 population estimates show a decrease in population by 3% of the 1990 figure.

Racial and Ethnic Composition

The racial composition of New Bedford's population is 88% White, 4% Black and less than 1% of American Indian and Asian races each.

By far the most dominant ethnic group in the community is the Portuguese, accounting for nearly 36% of the population. Also noteworthy is, that at 7% of the population, people of sub-Saharan African descent are the second largest ethnic group in New Bedford. The Portuguese community are the major ethnic group in the groundfish fleet in New Bedford. When compared to the Sicilian fishing families of Gloucester, this Portuguese community has maintained strong ties to their ancestral country (Hall-Arber, 1996). During the 1970s and 80s, New Bedford also had a large Norwegian population that were involved in the fisheries, primarily as scallopers. However, fewer are present in the fisheries today because "most of us have educated our children out of the fishing industry (Hall-Arber, 1996)."

Age Structure

Approximately 44% of New Bedford's residents are between the ages of fifteen and forty-four. Twenty-one percent of the population is under fifteen and 35% are over forty-four.

Marriage

According to the 1990 Census, approximately 49% of the population of New Bedford 15 and older are married. Twenty-eight percent have never been married, 10% are widowed and 8% are divorced. Of those widowed, approximately 15% are men and 85% are women.

Household Composition

There are 38,646 households in New Bedford with an average of 2.51 persons per household. Nearly 70% are family households; fifty percent are married-couple family households, 3% are family households with male householders and 17% are family households with female householders. Thirty-four percent of the households in New Bedford include children under 18

years old. Thirty percent of all householders are over 65 years old. Table 3.8 gives additional information on housing composition for New Bedford.

TABLE 3.8
HOUSEHOLD COMPOSITION
NEW BEDFORD, MA
Source: U.S. Bureau of the Census

Total Number of Households	38,646
Average Number of Persons per Household	2.51
Percent of Married-couple Family Households	49.7
Percent with own children under 18	22.1
Percent of Male Householder Family Households	2.8
Percent with own children under 18	1.3
Percent of Female Householder Family Households	16.5
Percent with own children under 18	10.4
Percent of Non-family Households	31.0
Percent of Householders Sixty-five or older	29.1

Table 3.9 shows the housing information for New Bedford according to the 1990 Census. There are 41,760 housing units, of which 92.9% are occupied. Of the occupied housing units, 43.8% are owner occupied and 56.2% are renter occupied. Of the vacant housing units, only 1.8% are vacant due to seasonal use.

TABLE 3.9
HOUSING INFORMATION
NEW BEDFORD, MA
Source: U.S. Bureau of the Census

Total Housing Units	41,760
Owner-occupied Units	17,003
Median Value	$115,900
Renter-occupied Units	21,785
Median Contract Rent	$313
Vacant Housing Units	2,972
Housing Units Vacant for Seasonal Use	54

Educational Trends

Only half (49.6%) of New Bedford's residents 25 and older are high school graduates according to the 1990 Census. Over thirty percent of the population has not been beyond ninth grade. Table 3.10 shows the educational attainments of the residents of New Bedford.

TABLE 3.10
EDUCATIONAL ATTAINMENT
(PERSONS 25 YEARS AND OLDER)
NEW BEDFORD, MA
Source: U.S. Bureau of the Census

	# of Persons	% of Population 25 Years and Over
Less than 9th grade	20,046	31.1
9th to 12th grade, no diploma	12,451	19.3
High school graduate (includes equivalency)	16,492	25.5
Some college, no degree	6,719	10.4
Associate degree	2,569	4.0
Bachelor's degree	4,446	6.9
Graduate or professional degree	1,831	2.8

In New Bedford, fishermen often finish formal schooling by the time they reach fifteen; this is especially true for those fishermen who are immigrants (Hall-Arber, 1996). The schools in New Bedford seem to be having trouble addressing the cultural diversity necessary for the success of the educational system.

Economic Characteristics

Income The per capita income for New Bedford was $10,923, according to the 1990 Census; this is considerably lower than the per capita income reported for Gloucester ($16,044), although fishermen's incomes in New Bedford tend to be higher than those of Gloucester fishermen (Hall-Arber, 1996).

Employment New Bedford's unemployment rate is 12.2% of the civilian work force. Less than 1% of the employed work force is in the armed forces. In the civilian employed population, 52% are male workers and 48% are female workers. Forty percent of the residents over 16 do not participate in New Bedford's labor force.

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Seventy-five percent of employees are private for profit wage and salary workers. Nearly 15% of New Bedford's workers are employed by the local, state or federal government. Self-employed workers only constitute 4% of the employed residents of New Bedford.

Technicians and administrative occupations (27%) and *operators, fabricators and laborers* (26%) were the most frequently reported occupations in the 1990 Census. *Farming, forestry and fishing* constitute nearly 3% of New Bedford occupations.

Employment by Industry In New Bedford, the largest industries by the number of people employed are *professional and related services* (21%), *retail trade* (17%) and *manufacturing* of *durable* (12.5%) and n*ondurable* (15.3%) goods. Once an essential industry in New Bedford, the textile industry has since closed many factories, contributing to the downturn in the city's economy (Hall-Arber, 1996). Another gap in the economy has been caused by the departure of the Polaroid plant, considered to be a major employer. *Agriculture, forestry and fisheries* industries employ 1248 people, or approximately 3% of New Bedford's employed residents over 16. However, due to the restricted fisheries, employment has declined not only in harvesting but also in seafood processing (Hall-Arber, 1996) Table 3.11 shows the role of industry in employment of New Bedford residents.

TABLE 3.11
EMPLOYMENT BY INDUSTRY
(EMPLOYED PERSONS 16 YEARS AND OVER)
NEW BEDFORD, MA
Source: U.S. Bureau of the Census

Sector	# Employed	% Employed
Agriculture, forestry, and fisheries	**1,248**	**3.2**
Mining	23	0
Construction	2,440	6.1
Manufacturing, nondurable goods	6,143	15.3
Manufacturing, durable goods	5,014	12.5
Transportation	1,345	3.4
Communications and other public utilities	826	2.1
Wholesale trade	1,746	4.4
Retail trade	6,835	17.1
Finance, insurance, and real estate	1,649	4.2
Business and repair services	1,257	3.2
Personal services	1,064	2.7
Entertainment and recreation services	270	0.1
Professional and related services	8,367	20.8
Public administration	1,958	4.9
Total	40,185	100

FISHERIES PROFILE

New Bedford is an old fishing community. Many of its members are descended from Portuguese fishing families and kinship networks are an extremely important influence on employment

patterns in the fishing industry (Doeringer et al. 1986). The Portuguese families are very close and many trace their families back to fishers in Portugal. One respondent describes how when he was 5 years old he would go fishing tied to the mast of his grandfather's boat. All the boys in his generation were fishers except one. Now his extended family as 8 and his sons all fish, but they are not encouraging their sons to fish.

New Bedford has learned a great deal about how to survive crises in fisheries. The Fishermen's Family Center began in 1994 in response to the collapse in the groundfish fishery with held from the Federal Government. Thirty two boats in New Bedford were removed through the by back program. With help from the Center, ex-fishers are finding jobs, particularly in the marine trades, computers and the trucking industry. The marine trade jobs tend to by in NY, NJ and in Boston. Other industries in New Bedford have been supportive of the fishers through the crisis and extended family networks have helped. Getting hired by relatives helps many fishers to get off-boat jobs that give them flexibility that lets them fish when they can.

In New Bedford, three commercial fisheries, and a small recreational fishery, are important for the management of billfish and highly migratory species.

Distant Water Swordfish Fishery
All the longliners that bring highly migratory species into New Bedford are large "distant water" boats. During much of the year their product is initially landed in San Juan Puerto Rico and transhipped to New Bedford and other destinations. According to the man who runs the largest distant water fleet out of Massachusetts, the main problems faced by the distant water boats are expenses and the price of fish. The price of swordfish has steadily been going down. It is a generic product, the same from each country, and there is too much fish on the market. They compete with foreign factory boats catching, freezing and exporting swordfish. The distant water fleet does not, for the most part, produce the highest quality US swordfish so they have to compete directly with cheaper imports for the lower-end markets.

Because of these problems and the pressures brought about by increased regulation and decreasing fish stocks, the distant water fleet has had to respond by taking longer and longer trips. This has affected family life. The wife of one distant water captain said that she would like to have children but she does not want "to be a single mother, especially when I am married." Her husband, who fishes in southern waters much of the year and lands his catch in San Juan, is simply not home long enough to share in parenthood duties. When swordfishing is closed he is home, but the closures mean that he is away from home more than in the past because he is not able to afford to alternate trips with another captain. Finding sources of emotional support is difficult. When her husband does come home it is also painful. They spend the first week just getting used to one another, he is used to a boat full of men and she is used to having the house to herself. Then they have a couple of good weeks. When he leaves it is as if he leaves a week early because in the last week his mind is all in getting ready to go. The distant water wives generally don't know each other well. Her social life does not revolve around fishing or being a captain's wife. New Bedford has a fishermen's wives association but that is for "older Portuguese women" and mainly for scallopers and draggers - "those who do only 14 day trips." Leaving

fishing would be a difficult decision for this family financially, because her husband has no college education, and emotionally, because they have built a family life around fishing. Problems like this have been documented in other fishing families going through changes brought about by loss of fish stocks and increased regulation (Binkley 1996). These problems are exacerbated in the distant water fleet. Many of these fishers live some distance from established fishing communities and even when they do live in fishing communities there can be a social separation. New Bedford respondents not associated with the distant water fleet report that they see it as socially distant from the rest of the community. Unlike the other two fisheries discussed here, the distant water boats are not part of the ethnic and kinship networks that underlie fishing in New Bedford.

The distant water fleet has managed to address some of its personnel problems by turning to a global employment network. The range of these boats over many different waters makes them particularly dependent on the skill and experience of their captains. The man who runs the largest distant water fleet in New Bedford reports that he has not had to hire a new captain in the past four years. The last time he brought in an experienced man from Hawaii. He does use part time captains who are often elevated crew filling in. He is also relying more and more on foreign, particularly West Indian, fishing crew. Recent trips have not been remunerative for crew. Assuming 18 hour days, the last eight trips (267 days at sea) of the largest fleet paid their highest paid crew an average of $5.25 an hour.

The fish house in the New Bedford that does the most business with the distant water fleet does 15-20 million dollars worth of business each year: 60% swordfish, 15% Tunas (yellowfin, bigeye, bluefin) 10% lobster and 15% other including some sharks and bait sales. They buy about 50% from US boats and 50% foreign and sell the swordfish to other wholesalers and some supermarkets. They employ from 40 to 65 people depending on supply conditions.

When fishing is disrupted through closures the fish houses have experienced larger labor fluctuations. This has led to not being able to keep steady employees and they are losing, in particular, those employees with families to support. Even the increased reliance on imports has not completely solved this problem. When they make an effort to buy from American boats in distant waters, disruptions make their operations particularly difficult because of the arrangements and timing that are required to get the fish to market. They have to unload close to an international airport with the lift capacity, which in the Caribbean means only San Juan. They have to hire people to unload any boat landing in San Juan and send supervisors so that the fish is kept cold, properly weighed and counted. They have to arrange a cargo departure and maintain a certain volume of fished based on a negotiated freight weight. These activities are easily disrupted by closures and other regulatory decisions.

The Pelagic Drift Net Fishery

Twelve boats in New Bedford are involved in using 20-22 inch mesh drift nets to fish for swordfish. These boats range from 60-80 feet. Some of these fishers had been harpooning for swordfish in the past and shifted into drift nets in the late 80s when declining stocks and

competition from longliners made it more difficult to break even in the harpoon fishery. Others went into drift net fishing in response to the groundfish decline. The last new boat entered the fishery in 1993-94. The drift net a quota allows one trip a year, which is a derby fishery that lasts 7 to 10 days. Respondents complain that the fishery has become a dangerous one. They are given 24 hours to return when the fishery closes which meant they have to be back very quickly. Initially this was true even in bad weather, but they now have a bad weather exemption that resulted from complaints about the danger. These fishers have formed the North East Atlantic Swordfish Net Association to represent their interests.

All of the boats currently involved in this fishery have permits in other fisheries, mainly groundfish, squid, butterfish, and summer flounder. Many of these boats are already paid for and this allows them to reduce the insurance coverage as well as not have to pay a mortgage note. Nevertheless, it is very difficult for them to keep their crew employed all year round. One responded reports that his crew has had to find ways to be flexible. Several work for themselves as handymen or clean up men. One is a used car salesman. Another captain reports that he is able to keep his crew in steady employment only by taking long trips for summer flounder and squid. Groundfish is still his mainstay, but he can do this for only 88 days. He fishes for summer flounder in Virginia, which means that the crew are away from home for two months at a time. If he did not go swordfishing they would have to both take more time off and go for winter squid, butterfish, and whiting. These are traditionally New Jersey fisheries and he anticipates that this will lead to gear and crowding conflicts with both fixed and mobile-gear fishers operating off of New Jersey.

The Atlantic Bluefin Tuna Purse Seine Fishery

Of the five boats that hold permits to fish in the bluefin tuna purse seine fishery, four are associated with New Bedford. One is owned by residents of the city and three others land their catch in New Bedford. All four have crew members that live in the city. Three of these boats do nothing else but fish for bluefin tuna, the rest of the year they are tied up at the dock. The fourth boat has scallop days in addition to the bluefin tuna permit. The tied up boats take 26 crew combined, 24% less than they did at the height of this fishery in the 1980s. Many of these crew members are family and almost all have been with these boats for a long time. The average age is considerably older than that of most fishing crews. When the boats are tied up they collect unemployment and do odd jobs. Wives are working who did not have to in the past. One crew member is 70 years old and a respondent who is this mans boss says that he cannot retire because of lost income.

The income from all of these boats is much less than in the past because of cuts in price and in their bluefin tuna quota allocation. The last such cut was a 41% reduction in 1995. Where rising prices for bluefin tuna has been able to take much of the sting out of quota reduction in the past, this is no longer the case. The drop in income has not only resulted in fewer crew, it has led to cutbacks in maintenance which, one owner said, has compromised safety to some extent. One boat that would spend between $25,000 and $40,000 a year in a local ship yard now does so every other year. They are at the point where "we only repair what breaks."

The New Bedford firm that buys bluefin tuna from the purse seine fleet has been in the bluefin tuna business since the early 60s. They also buy frozen, imported swordfish. The swordfish boycott has had little impact on their business. Unlike other fish that his business handles, they do not buy and sell the bluefin tuna but provide unloading, cooling, and processing services to the boats. They process for a flat fee per lb and, the respondent claims, take very little risk as a result. The business employs 200 people and will not lay off workers if the bluefin tuna quota is cut. However, they have made a great deal of money from the purse seine bluefin tuna even with only 150 tons of quota. While bluefin tuna currently makes up only 1.25% of their gross dollars, it accounts for 25% or more of their net profit.

Another role the purse seines play is providing the bulk of the support to the East Coast Tuna Association. This is an organization that speaks for the purse seiners in matters of mutual concern. Other respondents suggest that this organization also works very closely with other bluefin tuna stakeholders. The concentration of some of the wealth generated by the bluefin tuna in small number of hands is seen to have an organizational benefit for other stakeholders as well.

Recreational Fishing in New Bedford

The offshore recreational industry in New Bedford is concerned with bluefin tuna and with shark. Charter customers in New Bedford come are tourists coming from all over the country. Most of these customers have planned ahead to do fishing. Charter boats in New Bedford to not do pickup charters. There are 9 marinas in New Bedford harbor, which also includes Fairhaven. None of them are specialized in particular species. One respondent estimated that there are about 7 total charter boats in the harbor of which only one specializes in offshore. This captain spends winters in Florida and summers in New Bedford. One other charter captain goes offshore sometimes as well. Offshore charters target bluefin tuna and shark. As is the custom where general category permits are common, when bluefin tuna are caught they belong to the boat. The one charter captain that specializes in off shore fishing has a general category permit and sometimes fishes for bluefin tuna without charter customers. For shark he imposes his own size limits which are more stringent than the one proposed under the FMP. He also imposes his own minimum bluefin tuna size limit of 75."

Shark tournaments are quite important in promoting business in the area, they bring in curious people because it is a dangerous and exciting fish. The shark tournaments offer prizes but not extremely large ones. The tournaments attract repeat people, and there is an important "reunion" dynamic. Tournament participants generate a great deal of money. One shark tournament is held here in New Bedford. There are also billfish tournaments nearby at Block Island, Nantucket, Falmouth Offshore Grand Prix and Shag Harbor, but none in New Bedford. While recreational shark fishing is mainly catch and release fishing, respondents argue that tournament prizes in this area cannot be done by catch and release. This is because they go too far offshore (100 miles) to make taking observers practical. They believe that the loss of the trophy fish exemption for tournaments would shut the tournaments down. Using pictures because it requires handling 500 lbs of angry muscle.

Most charters boats in the New Bedford area are owner operated. Respondents report that it can be hard to find a suitable mate because the business is seasonal. They are not willing to hire unemployed commercial guys because they are rough. They need people with tact. Being a charter mate is always a secondary job and they always have to make accommodation with the primary job.

FISHERIES MANAGEMENT ISSUES

Other Comments Offered by Respondents

New Bedford fishers express their greatest anger for fishing regulations which make them discard what would otherwise be marketable products. The story of one distant water boat, which had to dump a reported 41,000 lbs of swordfish because it could not prove it had caught them in south of 5 degrees, had made the rounds to many ports where this research was conducted. It is considered an example of particularly egregious fisheries mismanagement.

The pelagic drift net fishers feel that they have been unfairly associated with destructive, large scale drift net fishing in the Pacific. They point out that their nets are fairly short (1.5 miles) and have a large mesh size. They maintain that their fishery, in the season and locations where it is prosecuted, is a very clean fishery for mature swordfish.

All respondents were upset with the organizational difficulties that result from not knowing when a quota is going to be filled or, in the case of the pelagic drift net fishery, not knowing if they were even going to have a quota three months before it should begin. This uncertainty, and the disruptions is causes in their businesses and even in their lives, is a key source of frustration with fisheries management.

Bluefin tuna fishers are all convinced that the numbers of fish are increasing. They feel that the current management plan is working. Some say that there are as many fish now as there have ever been. What upsets people involved in the bluefin tuna the most is the idea that there are two stocks of bluefin tuna rather than a single stock that migrates between North America, Europe, and the Mediterranean. They cite aerial surveys and the tagging data to support their position. Several who interact with European bluefin tuna fishers and have visited their fishing grounds maintain that they do not practice conservation nearly as well as US fishers do and that restrictions on US fishers are, therefore, unnecessary and unfair.

Attitudes toward the purse seine fleet are interesting and informative of the way fishing communities view things. One would expect other stake holders to resent a small number of boats having a substantial quota, and, indeed, some respondents did express such resentment. Several others, especially among the commercial fishing community, have a very positive attitude towards the purse seiners. They credit them with the creation of the bluefin tuna market that is benefitting everyone, and see them as having fairly earned their preeminent position by being both pioneers and highly skilled fishers.

CHAPTER 4 - NEW JERSEY

STATE PROFILE

Demographic and Economic Characteristics

The population for New Jersey in the 1990 Census is 7,730,188 residents. The educational attainment in New Jersey is such that nearly 77% of the residents 25 and older are high school graduates. The unemployment rate in this state is 5.7% of the civilian labor force. Industries that are important sources of employment include *retail* (employing 15% of the working residents), *manufacturing* (durable goods - 8%; nondurable - 9%), and *construction* (6%); *agriculture forestry and fisheries* industries only employ approximately 1% of the working population of New Jersey. The per capita income of New Jersey for 1989 is $18,714.

Fisheries Characteristics

Bluefin Tuna In 1996, landings of bluefin tuna in New Jersey totaled 17,270 pounds; these landings accounted for less than 1% of the total bluefin tuna landings in the Atlantic and Gulf states in 1996. These New Jersey landings were valued at $66,781 which represents less than 1% of the total economic value of bluefin tuna landings in the Atlantic and Gulf states (NMFS).

Swordfish The 1996 landings of swordfish in New Jersey totaled 244,989 pounds; these landings accounted for nearly 5% of the total swordfish landings in the Atlantic and Gulf states in 1996. The value of these landings was $801,574 which represents 5% of the total economic value of swordfish landings in the Atlantic and Gulf states for 1996 (NMFS).

Large Coastal Sharks In New Jersey, landings of large coastal sharks totaled 574,083 pounds; the value of these landings was $393,940 (NMFS).

Recreational Fishery In 1996, there were 841 saltwater anglers in New Jersey; these anglers account for approximately 9% of the total number of saltwater anglers in the United States that year. Sixty-three percent of those anglers were residents of New Jersey and 37% were nonresidents. There were 10,366 days of saltwater fishing in New Jersey in 1996; these days accounted for approximately 10% of the total days of saltwater fishing in the United States that year. Eighty-four percent of those days were by residents of New Jersey and 16% were by nonresidents (FWS, 1997).

In 1996, expenditures by saltwater anglers in New Jersey totaled $746,904,429; this accounted for nearly 9% of the total U.S. expenditures by saltwater anglers that year. Saltwater fishing in New Jersey had an economic output of $1,483,741,878 (5.9% of the U.S. total), generated wages and salaries of $414,464,135 (6.2%) and created 16,112 jobs (5.6%) (ASA, 1997).

MAJOR NEW JERSEY HMS AND BILLFISH COMMUNITIES

Demographic Characteristics

The communities in New Jersey likely to be affected by Fishery Management Plans are found in Table 4.1. These range from larger inland communities, such as Brick Township with a 1990 population of 66,473, to small coastal communities, such as Barnegat Light with a 1990 population of 681 (Table 4.1). All of these communities have gender compositions suggesting a ratio of more women to men, with the exception of Barnegat Light and Cape May, which happen to be two of the most prominent fishing communities in New Jersey. The age structure of these communities, characterized by the age group of 15 to 44 years, shows a range from approximately 33% in Barnegat Light, to 44% in Brick and Point Pleasant. Brick Township and Forked River have the greatest percent of married family households at around 64%, while Barnegat Light and Cape May have the least at around 50%. School enrollment is highest in Point Pleasant (24% of the population over 3 years old), Brick (23%) and Brielle (22%), but strikingly low in Barnegat Light (11%).

Economic Characteristics

Sea Isle City has the highest unemployment rate, at 8.4% of its civil labor force, while Barnegat Light has an unemployment rate of only 1%. The remaining communities have unemployment rates that range from 2.7% in Manasquan to nearly 7% in Brielle. The highest incomes per capita are found in Barnegat Light ($25,973) and Brielle ($24,027); Cape May ($15,884) and Forked River ($14,875) have the lowest income per capita of the communities shown in Table 4.1.

Among the top communities, the fishing industry as an employer is most prominent in Barnegat Light; nearly 13% of the communities employees work in the fishing industry. By comparison, the fishing industries of the other top communities employ less than 2% of their workers.

Fisheries Characteristics

Table 4.2 gives 1996 landings and permit information for the communities in New Jersey likely to be affected by Fishery Management Plans.

Bluefin Tuna Barnegat Light, by far, has the largest bluefin tuna landings with 10,922 pounds (dry weight) for 1996; Sea Isle City and Point Pleasant follow Barnegat Light in landings with 2,355 and 1,387 pounds, respectively. However, as far as commercial and recreational tuna permits, Point Pleasant and Cape May have the largest number of permits. After these two communities, Brielle and Manasquan also have a sizable number of commercial and recreational tuna permits

Swordfish In 1996, Barnegat Light had 12,899 pounds (dry weight) of swordfish landings. This far exceeds the landings of the other New Jersey communities with swordfish landings. Point Pleasant and Sea Isle City also had appreciable landings of swordfish in 1996.

Large Coastal Sharks At 515 pounds, Barnegat Light' landings of large coastal sharks were the highest in New Jersey in 1996. While much lower, Sea Isle City and Brielle also had sizable large coastal shark landings.

TABLE 4.1
NEW JERSEY COMMUNITIES AFFECTED BY FISHERY MANAGEMENT PLANS
DEMOGRAPHIC CHARACTERISTICS
Source: U.S. Bureau of the Census

Community	1990 Census Population	Sex Ratio M/F	% Married Family Households	% of High School Graduates Age 25 and over	Civil Unemployment Rate	1989 Per Capita Income	% Agriculture, Forestry & Fisheries Industry
Barnegat Light	681	1.08	50.3	84.9	1.0	$25,973	12.6
Beach Haven	1,475	0.94	52.1	84.2	6.5	$18,527	0.9
Brick	66,473	0.91	63.9	79.8	5.6	$16,523	1.3
Brielle	4,406	0.93	60.3	91.3	6.9	$24,027	1.6
Manasquan	5,369	0.96	52.5	88.2	2.7	$19,409	0.5
Point Pleasant	18,177	0.90	59.1	81.1	4.5	$18,770	1.5
Cape May	4,668	1.18	50.4	84.4	6.4	$15,884	1.6
Forked River	4,243	0.97	63.5	76.7	4.4	$14,875	1.4
Sea Isle City	2,692	0.93	54.6	78.9	8.4	$17,768	0

TABLE 4.2
NEW JERSEY COMMUNITIES AFFECTED BY FISHERY MANAGEMENT PLANS
FISHERIES CHARACTERISTICS
Source: NMFS

Community	Bluefin Tuna Landings *dry wt in lbs*	Bluefin Tuna Landings *rank*	Commercial Tuna Permits *number*	Commercial Tuna Permits *rank*	Recreational Tuna Permits *number*	Recreational Tuna Permits *rank*	Swordfish Landings *# of fish*	Swordfish Landings *rank*	LC Shark Landings *# of fish*	LC Shark Landings *rank*
Barnegat Light	10,922	1	76	5	26		12,899	1	515	1
Beach Haven			30	8	57	4				
Brick			29	9	55	5				
Brielle			91	3	41	10	69	5	35	3
Manasquan			82	4	76	3				
Point Pleasant	1,387	3	175	1	143	2	2,105	2	13	5
Cape May	553	4	115	2	228	1	90	4	8	6
Forked River			19		42	9	31	7	18	4
Sea Isle City	2,355	2	14		22		703	3	162	2

BARNEGAT LIGHT COMMUNITY PROFILE

Barnegat Light is one of the 11 municipalities on Long Beach Island, a large "barrier beach" island that helps form the seaward boundary of Barnegat Bay. This small town with less than one square mile in area is located on the northern end of the barrier island. The town is named after its famous lighthouse that guided ships for generations along the New Jersey coast. The name Barnegat originates from “Barende-gat,” a Dutch name meaning “inlet of breakers” (Beck, Henry Charlton, 1963).

Until recently in order to reach the ocean, boats had to go through one of New Jersey's narrow and often dangerous inlets, a factor that has worked against major maritime development, in contrast with beach-oriented tourism. In 1995, the infamous inlet’s fierce currents were tamed by the forty-five million dollar Army Corps of Engineers project that constructed a south jetty along with a three-quarter- mile beach, a fishing pier, and affords bird watching opportunities (Beacon, 1994). Commercial and recreational fishing have a long tradition here, as they once did in the community of Beach Haven on Long Beach Island, which is now only private boat marinas and residential condominiums.

DEMOGRAPHIC PROFILE

Population

According to the 1990 Census, this small seashore town, with less than one square mile in area, has a population of 681 (U.S. Bureau of the Census). There are 1.8 males for each female.

Racial and Ethnic Composition

The major race of the town is White, comprising 99.6% of the population. The Black component makes up the remaining fraction of a percent for the racial composition. American Indian, Eskimo, Asian, Pacific Islander and any other races are not represented in the racial composition of the Barnegat Light population.

The ethnic composition, based on single ancestry, is primarily European. German ancestry has the highest percentage with 12.2%. The second highest ranked ancestry, which is Irish (4.7%), is followed by three ancestries in close percentage range: English (3.8%), Italian (3.1%), and Polish (2.8%).

Age Structure

The age structure in Barnegat Light is that of an aging population. Thirty-three percent of the population is between age 15 to 44. The 45 to 64 years age bracket and the 65 and over age bracket, which are the two eldest cohorts, comprise 57% of the population. The remaining population are under age 15.

Marriage
According to the 1990 Census, 60% of the population of Barnegat Light 15 years and older are presently married. Nineteen percent have never been married, 11% are divorced and 9% are widowed. Of those who are widowed, 72% are women and only 28% are men.

Housing Composition
According to the 1990 Census, Barnegat Light has 342 households with an average of 1.99 persons per household. Out of this total, there are approximately 62% family households and 38% non-family households. Table 4.3 gives additional household information for Barnegat Light.

TABLE 4.3
HOUSEHOLD COMPOSITION
BARNEGAT LIGHT
Source: U.S. Bureau of the Census

Total Number of Households	342
Average Number of Persons per Household	1.99
Percent of Married-couple Family Households	50.3
Percent with own children under 18	10.0
Percent of Male Householder Family Households	3.2
Percent with own children under 18	0
Percent of Female Householder Family Households	8.5
Percent with own children under 18	4.4
Percent of Non-family Households	38.0
Percent of Householders Sixty-five or older	40.1

According to the 1990 Census, the total number of housing units in Barnegat Light is 1,187, of which 28% are occupied and 62% are vacant. Of the occupied housing units, approximately 82% are owner-occupied and 18% are renter-occupied. Over three quarters of the vacant housing units (86%) are used for seasonal or recreational use. Table 4.4 gives additional housing information for Barnegat Light.

TABLE 4.4 HOUSING STRUCTURES BARNEGAT LIGHT Source: U.S. Bureau of the Census	
Total Housing Units	1,187
Owner-occupied Units	271
Median Value	$258,900
Renter-occupied Units	59
Median Contract Rent	$550
Vacant Housing Units	857
Housing Units Vacant for Seasonal Use	737

Education Trends

In terms of educational attainment, 84.9% of the persons 25 years and older are high school graduates. Table 4.5 gives additional information on the educational attainments of the residents of Barnegat Light.

TABLE 4.5 EDUCATIONAL ATTAINMENT (PERSONS 25 YEARS AND OLDER) BARNEGAT LIGHT Source: U.S. Bureau of the Census		
	# of Persons	% of Population 25 Years and Over
Less than 9th grade	27	4.6
9th to 12th grade, no diploma	62	10.5
High school graduate (includes equivalency)	199	33.8
Some college, no degree	99	16.8
Associate degree	26	4.4
Bachelor's degree	116	19.7
Graduate or professional degree	60	10.2

Economic Characteristics

Income According to the 1990 Census, the per capita income for Barnegat Light in 1989 was $25,973. This level of income is in line with the per capita income of Brielle ($24,027), but is considerably higher than the per capita income for the state ($18,714).

Employment Of the residents 16 years and older, 51% participate in the civilian labor force. The unemployment rate for Barnegat Light is only 1% of the civilian labor force; this is considerably lower than the state unemployment rate (5.7%).

In looking even closer at the workforce through examining the worker's class, 64.1% of the number employed comprise the *private for profit wage and salary workers*; *self-employed workers* are 21% of the working population.

Employment by Industry The highest percentages of employment by occupation are *managerial/professional* with 32.4% and *technicians/administrative* with 31.4%. *Precision production, craft, and repair*, which has 13.9 %, is the third ranking occupation. *Farming, forestry, and fishing* occupations has 10.3%. Table 4.6 gives additional information on the industries in Barnegat Light form the 1990 Census.

Local Business In looking at the small town of Barnegat Light, it becomes apparent that the small businesses are very reliant on the summer tourist economy and the year round fishing industry. This is apparent with all of the summer and beach houses, the seashore shops and convenience stores along the main boulevard to and through Barnegat Light. The tourist surf shops, souvenir shops, small grocery and convenience stores, fish markets, and even the electronics and repair shops advertise goods and service catering to the needs of their consumers. It also becomes apparent that the town relies fixedly on its commercial fishing industry year round. According to a resident, the commercial fishing becomes the stalwart economic sector for the town in the winter through employing as many as 150 local people to work at the marinas.

TABLE 4.6 EMPLOYMENT BY INDUSTRY (EMPLOYED PERSONS 16 YEARS AND OVER) BARNEGAT LIGHT Source: U.S. Bureau of the Census		
Sector	# Employed	% Employed
Agriculture, forestry, and fisheries	**39**	**12.6**
Mining	0	0
Construction	39	12.6
Manufacturing, nondurable goods	10	3.3
Manufacturing, durable goods	13	4.2
Transportation	7	2.3
Communications and other public utilities	6	1.9
Wholesale trade	4	1.3
Retail trade	65	21.0
Finance, insurance, and real estate	33	10.7
Business and repair services	16	5.2
Personal services	2	0.6
Entertainment and recreation services	9	2.9
Professional and related services	56	18.1
Public administration	10	3.3
Total	309	100

FISHERIES PROFILE

Throughout the interviews and meetings, several citizens and business owners from the Barnegat Light community emphasized the significant role the fishing industry has in sustaining and preserving their community. The marinas are the major source of taxes for the community, according to representatives of the community's taxpayers association. Two of the five marinas are primarily dependent on the commercial fisheries. An owner of one of the marinas told us that 80% of their overall income comes from the commercial fishing industry, for fuel and other services. Although there is a lot of recreational fishing, the amount of fuel and other services sold to recreational fishermen is tiny compared with what is sold to commercial fishers. One marina owner said that for fuel, the ratio is about 40 or 50 commercial to one recreational. In addition, small businesses are able to stay open all year because of the fishing industry, and this has stabilized the community so that it has the lowest crime rate on the island.

According to another respondent, the fishing industry is an integral part of the social and economic livelihood of Barnegat Light. In examining the fishing industry of the town, Barnegat

Light is one of Ocean County's most important ports. Of the 1993 Ocean County Landings totaling 28.5 million tons, the port totaled 3.8 million but the value of these landings was $9.1 million dollars, which calculates to be 39% of the Ocean County landings value (New Jersey Department of Agriculture, 1995). Many members of the East Coast's Longline fleet, scallop vessels, and a fleet of in-shore gillnetters reside at this port (NJ FishNet, NJ Seafood Association). Recreational and charter boats also utilize and work from this port. The recreational and charter boat fishing industries landings, percentages, and values were not available for the port or county level. New Jersey's statewide estimates for the marine recreational fishing are available in the State Profile section.

There are five marinas in Barnegat Light. The two largest docks have 36 full-time resident commercial boats, approximately 40 recreational and charter boats, and some transients. Commercial fishing boats work out of these docks year round. The three remaining docks can each accommodate approximately 30- 35 boats, most of which are recreational boats and charter/ party boats, with a few headboats. Most of the recreational and sportfishing fishing boats that utilize this port are here for part of the year, usually from May or June through early October.

One dock is completely occupied by commercial boats, the owners are also commercial fishermen. These commercial boats include seven scallopers, ten longliners that fish for tuna, swordfish, and tilefish, and about nine inshore-fishing net boats. All the boats are privately owned (New Jersey Fishing, New Jersey FishNet). Three offloading stations are part of this dock. During the slow to steady seasons, five or six locally hired full-time employees, the boat captain and crew perform the offloading. Additionally, dock hands are hired locally for the busy season. The choice for marketing and sale of the fresh fish can either be done by the captain or by the owners of the dock. The owners of the dock sell some of the catch to fresh fish markets in Boston, Philadelphia, Maryland and New York with the remaining being sold to local restaurants, retailers, wholesalers or at their own fish market, which is open from April to October (McCay, 1993).

The second of the largest docks accommodates ten commercial boats, fifteen charter boats, and twenty-five recreational vessels. This dock is primarily an offloading facility and can accommodate up to five vessels for offloading. During offloading, there are two people working the docks to help the captain and crew. The marketing and sales of the fish is done by the boat captain, who sells the fresh fish to local fish markets (McCay, 1993).

The Barnegat Light port is known for its offshore longliner fishery. Today it focuses on the tunas (yellowfin, bigeye) for most of the year and swordfish part of the year. A few continue bottom longlining, for tilefish, caught in deep waters of the outer continental shelf and canyons. The longlining tradition derives from a winter handline and longline fishery for cod, which lasted through the first part of this century and was prosecuted by Scandinavian immigrants among others. Tilefish were well known by the old-timers of Barnegat Light but markets were poor. In 1969 a captain began tilefishing again. In the early 1970s he and others cooperated in successfully creating a domestic market for tilefish, and this soon emerged as a major focus of

the longliners of Barnegat Light, as well as Montauk, New York and, more recently, Point Judith, Rhode Island. The fleets developed rapidly, attracting even some of the charter boat fishermen. They diversified into pelagic longlining, for swordfish and tunas, as tilefish catch rates diminished. Others moved into sea scalloping.

Although Barnegat Light is mainly a longliner fishing community, there is also a small group of coastal gill-netters plus seven large sea scallopers. And like all ports in the region, it has a significant recreational fishery, with an equally long tradition. The longliner fleet is side by side with the party boats at one of the docks. Indeed, one of the families is involved in both commercial and party boat fishing, including offshore "canyon" fishing for HMS. The HMS longliner fishery and the scallop fishery are the most important in economic and social terms. Consequently, declines in allowable catches, seasons, trip limits, and, for the scallopers, days-at-sea are threatening the fishing community. There are few viable options. According to the mayor, a commercial fishermen himself, "September 30th, it's doomed." That is when the actions required by the new overfishing requirements come into place for HMS and scallopers.

In regards the effects regulations and policy implementation have on the fishery, the regulatory system intensifies the economic marketing problems. The manager of one of a major local fish dock said that the management process creates derby fishing, through the opening and closing of seasons. This means that small businesses such as his have trouble keeping their markets. A good example is the shark management plan, which has two periods, one beginning January 1st, when boats in this area have no access, and the other beginning July 1st, when the rush for sharks results in a glut on the market. This is also true for weakfish and fluke management. Millions of dollars are lost, he said, because of derby fishing.

In terms of loss of revenue due to regulations, one resident commercial fishermen commented extensively on his personal losses due to the 1994 limit of 4,000 pounds per trip for harvesting Mako. His comments on the economic impact of the shark quota being cut in half were that he lost out on $25,000 in revenue each season. Then, he went on to comment further that when the 4000 pounds trip limit went into effect it stopped big vessels from operating. He also raised a point that each year the southern fleet overshoots their quota and the northern fleet must suffer. He questioned why make further cuts when he sees his catches have increased each season per hook set while the size remained the same. In his lifetime, he saw the striper taken from the commercial fishermen, the marlin, the sturgeon, and now serious cutbacks in swordfish, tuna, sharks, bluefish and every year more regulations on just about anything the commercial fishermen make a living on. Another resident added that charter/ party boats also suffer when they can not go out to fish. The entire fishing community is impacted. The sentiment of the fishermen seem to be that the federal government needs to let the “hardworking fishermen” make a living or “pay” the fishermen every time they are not allowed to fish for one of their target species.

Instances were shared of occasions when policy implementation practices damaged the economy of local businesses because the federal plan came out after or during the fishing fleet and local businesses made adjustments to gear, trip plans, and orders for costly supplies and equipment.

Fishermen attempt to adjust and cooperate with the management plans for the betterment of the fish resource, but the fishermen expressed their frustration that soon after they make adjustments, either the regulations change or new regulations come into affect that further impact the commercial fisheries target species and reduce alternatives. The adjustments made by commercial fishermen are often the only alternatives to sustaining their interests and livelihood in the commercial fishing industry. Fishermen and their community have strong concerns that the commercial fisheries future is in jeopardy due to the management agency's policy practices and implementation.

To the old-timers, the nature of the fishery has already changed profoundly in part because of the way regulations are applied, forcing people to specialize in different fisheries, rather than to be able to combine them or switch from one to the other. Now they are "boxed in," which increases pressure on fish. For example, the swordfish fishermen have nothing else to turn to; tuna quotas are way down and the market is poor for some of the tunas; there is a moratorium on tilefishing, hurting the longliners that moved away from that fishery in recent years; and the fishery for monkfish is very poor, with tight restrictions coming on line. Two local boats converted from swordfishing to monkfishing, at great expense, but failed to come in under the deadline for limited entry in that fishery. One option some captains from this port have taken is to go to other countries to fish, but that is not proving sustainable because once they have taught people in those countries, they are typically replaced by lower-cost captains.

Another change in the fishery is that crews, at least for the pelagic longliners and the scallopers, are less likely than before to come from local communities. Local job opportunities in construction and the service industries for tourism compete with working as a deckhand on a fishing boat, particularly with so many restrictions, declining catches, and poor markets, and thus crew come from other regions, where there are fewer opportunities, such as Nova Scotia, some of the southern states.

One sign of change in this fishing community that has intensified in the past 3 to 5 years is the loss of welders, woodworkers, mechanics, and others needed to support the fishereis. There used to be a full-time wleder and a couple of part-time welders in Barnegat Light. The full-time welder has been gone for over 3 years. Local carpenters have been gone for about 5 years. Whereas it once took a few minutes or maybe an hour or day to get help, now it can take a week. You can no longer get these services in town, or even within the region.

Some of the longliners of Barnegat Light have become distant-water operations, going to the Grand Banks of Newfoundland or even the waters off Greenland, as well as the Caribbean, Brazil, and other distant fishing grounds. The owner of one major fleet, of 6 longliners, left Barnegat Light recently. His vessels were among the dozen or so very large longliners that found a 31,600-trip limit too restrictive, and thus left the Atlantic Ocean for the Pacific Ocean.

Others strongly prefer to work closer to home, to take shorter trips. As one of the captains said, "I never wanted to be a gypsy, going to Puerto Rico, Hawaii, to fish." His father, one of the pioneers, explained further, "I never wanted any of our boats to go anywhere but Barnegat

Light....We have our own troubles, no need to go someplace else to find it, " referring to troubles with crew, engine break downs, buyers in distant ports. The options of those who resist going to other ports are far more restricted. The HMS plan, to close all areas north of 39 degrees north, Toms Canyon to the Hague Line, to pelagic longliner fishing to protect bluefin tuna, is thus very scary to them.

Taking their boats to distant waters, as has the one fleet owner mentioned earlier, remains an option, but it is very disruptive of family and community --the loss of that fleet has already had major impacts on local businesses. Recognition of the links between the pelagic longline fishery and the community itself is a reason why those who run the fishing docks, together with leaders of the community, are struggling to find ways to deal with problems in the fisheries. Another concern of local residents is that decline or demise of the commercial fisheries is likely to transform the use of the waterfront, bringing in condominium development where marinas are now, an outcome which many long-term residents find undesirable. Even more, the fisheries are perceived as part of the identity of this community. Hence, that would be "the end of Barnegat Light as we know it." For fishing families, the changes are even more significant. As one said, "There's no future in it," and sons and daughters are being discouraged from going into the business.

The Barnegat Light fishing community is buffeted by regulatory, resource, and market changes. The recession in Japan has immediate and serious repercussions for the longline fishery, severely depressing export markets and causing problems in domestic markets as well, as foreign suppliers of tunas and swordfish turn to the U.S. market. A local importer said that the percentage of overseas fish in the domestic market for swordfish and tunas has gone from 10% to 90% in just a few years. A representative of the longliner fleet observed that even if there are no changes on September 30th, "this fishery is gone," unless there are significant advances made at ICCAT and in the markets.

Also, the import versus domestic fish issue is a sensitive area. Among the issues raised by owners, captains, and buyers is the requirement that all bluefin tuna, billfish, etcetera found dead on the longline be cut off and returned to the sea. A leading U.S.-based importer-exporter, headquartered in Barnegat Light, claimed that this poses an obstacle to cooperation at ICCAT, because other nations see the practice as "criminal." "We're the laughing stock of Spain, France..." Moreover, compliance with the law requiring discards of this by-catch (now, about 30% of the catch must be discarded) has led to accusations from conservationists and others that they are "murdering all those fish." One idea seen as promising is that of IBQs, or indivdiual by-catch quotas, for swordfish and sharks. People in the HMS fishery business at Barnegat Light agree that changes must be made, to deal with the by-catch problems, such as having a government observer on board and being allowed to take everything you catch. They also appear to recognize the need for industry stewardship, expressing concern about large takes of bluefin tuna on the spawning grounds; as well as the need to limit access in a fair way. They mention the cooperative research programs for black cod (sablefish) on the Pacific coast and attempts to obtain similar programs for Atlantic tunas, allowing the sale of dead by-catch with proceeds going into special funds for research, monitoring, et cetera.

Another, even larger, regulatory concern is, quite obviously, that they are being tightly regulated when fishers of HMS in other countries are not. A frequent topic of conversation is the apparent poor support of the U.S. for ICCAT, as for example in still allowing quota overages. This ties in with the issue of whether HMS fisheries in the Mediterranean and Eastern Atlantic affect the abundance and condition of fish in the Western Atlantic. The opinions of the people interviewed, as well as the position of the Bluewater Fishermen's Association, which represents most of the longliner fishermen of this coast, is that "it's one pool." The head of the local taxpayer's association, hearing the local fishing community discuss these problems at our interview, asked, "With all of these regulations, aren't we making life very difficult while importing the same fish from other countries? Where is the protection of the fish?"

The longliner fishing community is defensive about its practices with regards to by-catch. It is criticized for being "non-selective" and a major source of mortality for bluefin tuna, marlins, undersized swordfish, and other species. In turn, the captains note that when they are out there fishing for two or three weeks at a time, they have a strong economic incentive to key in on the best opportunities for "clean" catches. If they have high by-catches in one area, they move on.

The longliners see themselves as beleaguered whipping boys. They are already very vulnerable to losses of life and property at sea (viz. the popular new book, "The Perfect Storm," by Sebastian Junger; the recent loss of a local boat). They are increasingly vulnerable to other threats as well

Additionally, the point was raised that the United States has a small percentage of the global landings of species when compared to other countries. When framing the global landings issue, one respondent who is involved in the international marketing of fish responded by sharing what has been going on abroad. The respondents feel the United States fishermen are carrying a disproportionate burden under the regulations and management policies being proposed as well as under certain policies in practice for the small percentage of landings the United States commands in the global market.

Barnegat Light fishing community members interviewed also claimed that the environmental community has not adequately invested in the ICCAT management process, instead seeking to undermine it, relying more on the CITES process. What is needed is concerted effort on all parts to make the international program for HMS management work properly.

Some recognize the need to open up communications with others who fish for the same species, particularly the recreational fishing community spokespeople. The Recreational Fishing Alliance, in this area, is trying to get rid of longlining, but so far they have failed in their attempts to lobby congress for this. They are also concerned that the NMFS allows itself to become politicized in these battles, and they suggest that the science is under-used because of this. Other problems mentioned include discrepancies among the states in rules about selling fish, affecting the sense of inequity that pervades the commercial/recreational dispute. In Florida, New York, other states, there are few barriers.

In closing, one respondent expressed his feeling about the regulations' effects on Barnegat Light in saying ,"For years, we have tried to maintain our town, our community and provide for our people, as opposed to other towns that are more transit towns. The laws seem to sacrifice the maintenance of our town." The respondents from the community of Barnegat Light were in agreement when they heard the respondent make the previous remark.

BRIELLE COMMUNITY PROFILE

The Borough of Brielle is located in the southernmost region of Monmouth County. Brielle borders the Manasquan River. Becoming an independent Borough in 1919, the name Brielle was given to the new borough. Its name originates from being liken to a town in Holland named "Brielle." (Brielle Chamber of Commerce, 1994).

DEMOGRAPHIC PROFILE

Population

Brielle has a population of 4,406. The projected population for 2005 is 4,634. The population per square mile is 2,670 (Monmouth County, 1995); Brielle is 1.65 square miles in area. The ratio of male to female is approximately 1:1 with 2,123 males and 2,283 females (U.S. Census of 1990).

Racial and Ethnic Composition

The racial composition of the town is predominantly White with 93.7% The Black segment of the population makes up 5.5%. The American Indian, Eskimo, or Aleut populous represent less than a percent with 0.8%.

The ethnic composition, based on single ancestry, is primarily European. Irish ranked first with 10.1%. German ranked second with 6.9%. The third ranked single ancestry is English (5.5%).

Age Structure

According to the 1990 Census, approximately 36% of the residents are 15 to 44 years of age in Brielle. Nearly 50% of the residents are over age 44, while only 16% are under age 15; the predominance of people over age 44 suggests an aging populace.

Marriage

According to the 1990 Census, nearly 60% of the population of Brielle 15 years and older are presently married. Twenty-two percent have never been married, 10% are divorced and 8% are widowed. Of those who are widowed, 87% are women and only 13% are men.

Household Composition

The total number of households in Brielle is 1,735; these average 2.54 persons pe household (U.S. Bureau of Census). Out of this total, there are approximately 75% family households and 25% non-family households. Table 4.7 gives additional household information for Brielle.

TABLE 4.7 HOUSEHOLD COMPOSITION BRIELLE, NJ Source: U.S. Bureau of the Census	
Total Number of Households	1,735
Average Number of Persons per Household	2.54
Percent of Married-couple Family Households	60.3
Percent with own children under 18	21.3
Percent of Male Householder Family Households	4.4
Percent with own children under 18	0.8
Percent of Female Householder Family Households	9.9
Percent with own children under 18	3.1
Percent of Non-family Households	25.4
Percent of Householders Sixty-five or older	32.3

According to the 1990 Census, there are 1,986 housing units in Brielle, of which 87% are occupied and 13% are vacant. Of the occupied housing units, approximately 82% are owner-occupied and 18% are renter-occupied. Over half of the vacant housing units (52%) are used for seasonal or recreational use. Additional housing information is found in Table 4.8.

TABLE 4.8 HOUSEHOLD STRUCTURES BRIELLE, NJ Source: U.S. Bureau of the Census	
Total Housing Units	1,986
Owner-occupied Units	1,428
Median Value	$243,400
Renter-occupied Units	307
Median Contract Rent	$816
Vacant Housing Units	251
Housing Units Vacant for Seasonal Use	130

Education Trends

In terms of educational attainment, approximately 91% of the persons 25 years and older are high school graduates. Table 4.9 supplies additional information on the education attainments of the residents of Brielle.

TABLE 4.9 EDUCATIONAL ATTAINMENT (PERSONS 25 YEARS AND OLDER) BRIELLE, NJ Source: U.S. Bureau of the Census		
	# of Persons	% of Population 25 Years and Over
Less than 9th grade	75	2.4
9th to 12th grade, no diploma	201	6.3
High school graduate (includes equivalency)	856	26.9
Some college, no degree	761	23.9
Associate degree	236	7.4
Bachelor's degree	709	22.3
Graduate or professional degree	345	10.8

Economic Characteristics

Income According to the 1990 Census, per capita income for Brielle in1989 was $24,027. This level of income is similar to that of Barnegat Light ($25,973), but is considerably higher than the state per capita income of $18,714 for the same year.

Employment Of the residents 16 years and older, 63% participate in the civilian labor force. The unemployment rate for Brielle is 6.9% of the civilian labor force; this is only a bit higher than the state unemployment rate (5.7%). According to the U.S. 1990 Census, no one in Brielle is employed in the Armed forces.

The highest percentages of employment by occupation are *managerial/professional* with 44.7% and *technicians/administrative* with 31.5%. Less than 1% of the employed population is represented by the *farming, forestry, and fishing* occupations. 72.5 % of the employed population comprise the *private for profit wage and salary workers*. The *local government workers* and *self-employed workers* are in close percentage range for second ranking with 8.5% and 8.4%.

Employment by Industry In the industry sector table for employed persons 16 years and over, *professional and related services* represents nearly 27% of the percent employed population. *Agriculture, forestry and fisheries* represent 1.6% of the employed population. Table 4.10 gives additional information on industries in Brielle from the 1990 Census.

TABLE 4.10
EMPLOYMENT BY INDUSTRY
(EMPLOYED PERSONS 16 YEARS AND OVER)
BRIELLE, NJ
Source: U.S. Bureau of the Census

Sector	# Employed	% Employed
Agriculture, forestry, and fisheries	**34**	**1.6**
Mining	0	0
Construction	126	5.9
Manufacturing, nondurable goods	130	6.1
Manufacturing, durable goods	120	5.6
Transportation	104	4.8
Communications and other public utilities	80	3.7
Wholesale trade	144	6.7
Retail trade	459	21.4
Finance, insurance, and real estate	152	7.1
Business and repair services	111	5.2
Personal services	14	0.7
Entertainment and recreation services	45	2.1
Professional and related services	575	26.8
Public administration	50	2.3
Total	2,144	100

FISHERIES PROFILE

Although Brielle is the port for the study, in looking at the fisheries of Brielle participants agreed that the relevant unit should be called "The Port of Manasquan," including the municipalities of Brielle, Point Pleasant Beach, Point Pleasant, and Manasquan: all centering on the Manasquan River and Manasquan Inlet. We will call it Brielle/Point Pleasant. It is an area where recreational fishermen are as "traditional" as commercial fishermen. And recreational fishermen feel badly served by the management of bluefish, sharks, and tuna.

The Brielle/Point Pleasant port is one of the most important of the "inlet" ports along the barrier beach complex that makes up the New Jersey coast. It has been a center of both recreational and commercial fishing since the early 1800s. Within the memory of the people we talked with, there were at least 100 working charter boats in the port. Today Brielle has 21 charter/party boats of which 14 "full-time" headboats. There are 64 charter/party boats in Point Pleasant. The majority who fish offshore are private boats with angler permits. Many private boats fish for bluefin without permits as well. One of our respondents noted that at the winter seminars he holds on

tuna fishing, two-thirds of those attending have no permits at the time of the seminars, and only half of those say they plan to get them before fishing.

The area has historically, and until recently, been a bluefin tuna port; bluefin tuna, particularly schooling tuna, still remain important for some periods of the year, at least when the northern area is open for bluefin tuna fishing. According to historical documents found by a respondent, in the 1890s "catboats" from nearby Long Island were engaged in a bluefin tuna recreational fishery. In the 1930s there is documentation of huge catches by boats from ports of northern New Jersey, including Brielle/Point Pleasant. In one month of 1939, the weekly scores of northern New Jersey boats showed 19,998 bluefin tuna. Today, in 1998, the entire coast wide quota is 269 MT, or about 19,000 fish, the same amount, and for the whole year, not just one month.

Brielle recreational fishermen (private, charter and party boats) have historically targeted school bluefin tuna. This has been, until recent HMS regulations, an important fishery for the charter/party boat industry as well as private boat industry operating from Brielle and other New Jersey ports. New Jersey has had a recreational school bluefin fishery long before longliners, purse seiners and general categories developed their fisheries. The school bluefin tuna fishery is the historical fishery. Many boats from Brielle have targeted school bluefin tuna.

Today the offshore recreational fishery focuses mostly on yellowfin tuna. People in the industry are very concerned about the prospects for reduced yellowfin bag limits or quotas: "we're doing it all over again with the yellowfin...we know it's only a matter of years...." Among their concerns is the high likelihood that NMFS data have underestimated the catches, in contrast with state data. The data on catches for yellowfin tuna from just 4 states shows the catches for those states to equal the whole TAC of 1,075 MT. If ICCAT determines that yellowfin tuna must be regulated, and NMFS treats state data as "anecdotal," as they have, what next?

Here, as elsewhere in New York and New Jersey, the highly migratory species fisheries are often known as the "canyon" fisheries, because they take place along the edges and deep waters of the Baltimore and Hudson underwater canyons, as well as around eddies and at the edge of the continental shelf. In the past, we were told, bluefin tuna could be caught on day trips in coastal waters, rather than the canyons, and they were the major source of profit for the charter boat fleet here (and elsewhere in New Jersey and the larger Mid-Atlantic). Today, the canyon fisheries for tunas are thought of as extra opportunities for most charter boat captains, who have their regulars, who want a bluefish trip, fluke trip, a tuna trip.

At one time, the full-time "canyon fishermen" included hundreds of inshore bluefin tuna boats, "6-pack" boats (i.e. smaller vessels certified to carry no more than 6 passengers; also known as "uninspected" boats). One respondent recalls, 20 years ago, one night, about 20 miles out in the Hudson Canyon, seeing 300 boats fishing for tuna. Now, the boats have to go 80 miles offshore, on two day trips, dealing with the risks of the weather. This is what is known as the "canyon fishery." The only option now for HMS fishermen is the Canyon; "but the canyon fishery is a different animal," it takes place farther offshore, has larger boats, and is affected by decline in the fisheries. A similar trend is found in Cape May, New Jersey, for Baltimore Canyon. In both places, adding to the commercial and "for-hire" participation in the canyon fisheries is a very

significant involvement of private boat owners. Recent improvements in the U.S. economy have once again fueled investment in expensive offshore fishing boats, and this is a major contribution to New Jersey's economy. The majority of the private boats used and bought in the Cape May area, for example, are built in New Jersey.

It must be emphasized that New York and New Jersey still have viable canyon fisheries, and they are extremely important. The Hudson Canyon offshore fishery, of the Brielle/Point Pleasant fleet, really started 15 to 20 years ago, and they rely heavily on it for the fall fishery. This fishery has diminished, and the smaller, less powerful boats are gone. We were told that now "there's no such thing as owner-operated boats," just the boats of the larger fleets. The smaller boats have difficulty with the offshore, canyon fishery. One respondent said that this Labor Day weekend, there were maybe 100 boats out fishing, but other, less popular nights, only 3 or 4 at the most, and he's often all alone.

This year (1998) the local charter boats are generally unable to book tuna trips. They ... “can't get people to take the boat out if they're allowed to keep only one fish apiece." Inspected vessels (over 6 passengers) are not allowed to bring in any more than 3 fish/1 trip. “Twelve passenger” boats can not book on bluefin tuna. One of the charter boat owners/captains said his business did a study of the four "busiest captains" of the thirty they have (none are full-time). In 1991 they averaged 30-35 tuna trips each. In 1996 they averaged 10-12 trips. In 1997 they had one trip among the four. None of the captains have booked tuna trips for 1998. One of the captains shared his experience, beginning over 20 years ago in Montauk, New York making shark and tuna charter trips. In 1987, in New Jersey, still almost all charter trips were shark and tuna. But in 1998, he has had only two shark charters, a few more tuna charters. He estimates the business for sharks and tuna is about 10% of what it was before.

Today, bluefish has generally replaced the tunas as the important inshore/offshore fishery in northern New Jersey. This is a major turn around. According to a respondent, in 1949, there were 438 bluefish landed versus 11,000 bluefin tuna, in one week in the northern New Jersey ports. These were mostly schooling bluefin. There are large runs of "school" bluefin tuna out there now, but "you can't catch them and get the trips," that is, you are not allowed to catch enough of them, or with enough certainty, to get people to charter trips in advance. This fishery collapsed, in the late 1960s, after the advent of purse seiners in 1967. Respondents also pointed out that, according to a 1947 tackle shop publication, there were 193 full-time charter boats in New Jersey then, compared with fewer than 50 today. The difference, several people said, was due to "bluefin tuna taken away."

The Brielle/Point Pleasant charter and party boat fishermen interviewed are, like most other people involved in the sport fisheries, concerned to document the economic value of their fisheries. In this light, we were told of a recent study done in Virginia that found that 30% of the fisheries income in the state came from the offshore recreational fisheries. Our respondents emphasized that the figure is likely to be much larger for New Jersey.

Billfish are more often a by-catch in this fishery, compared with the southern part of New Jersey where they are an important directed fishery and the focus of a major tournament, the Mid-

Atlantic, alleged to be the "richest" marlin and tuna tournament in the world, according to the money paid out, for most of the 1990s. However, even in northern New Jersey billfish are important to the offshore canyon trips. At one time there were inshore trips for white marlin. And, according to a tackle shop owner in Brielle that caters to the offshore sports fishermen, the private boat owners at the Brielle docks want to catch billfish. This is a big part of the tackle shop business, representing a significant profit. Marlin lures cost up to $60, and people usually buy 6 or so at a time. There might be 25 or 30 boats in July and August doing this.

Swordfish has always basically been a commercial fishery in this area. There was a directed recreational fishery out of Shinnecock, New York, a very elite fishery. But now it is a valued and very rare by-catch. Local and other commercial boats landed swordfish, and tunas, in Point Pleasant for some years, particularly when an importer/exporter had a dock there in the 1980s-early 1990s.

There are 8 tackle shops in the Brielle/Point Pleasant area: 5 in Brielle, and others in Point Pleasant, Point Pleasant Beach, and Manasquan. There are two more that service primarily the shore and bank fishermen who fish Manasquan Inlet. Some are heavily dependent on offshore HMS fishing. One respondent says that his business depends on HMS for 70% of its overall sales. The regulatory system has the power to shut them down, and the uncertainties and last minute changes in regulations make it very difficult: "For bluefin tuna, we have to anticipate in November of December for the next year; tackle is ordered, made for us, and by the time the regulations come out--or don't come out, as was the case this year, reverting to last year's regulations--people don't buy the equipment and I still have to pay for it." He and others have requested from NMFS a buy-back similar to what was arranged for the New England commercial fishing fleet. Similarly, in Cape May, tackle shop owners perceive a crisis, and some are considering moving to southern states. Adding to the general problems of the offshore fisheries is the effect of the "southern line" for bluefin tuna on New Jersey enterprises. This line, roughly at the Delaware Bay, between New Jersey and Delaware, is used to separate a southern from a northern bluefin tuna fishery. The northern bluefin tuna fishery has been effectively closed for much of the last 4 years, motivating customers and boat owners to go to the south of the line.

This was a line established by NMFS to divide the angling quota into a north and south region. The north region is any fishing area north of 38 degrees 47 minutes and the south is any region south of this line. Recreational bluefin tuna fishermen from Brielle will fish in the northern zone whereas fishermen from Cape May and other southern ports can also fish in the southern zone. However, when those fishermen who fish in the southern zone return to a New Jersey port with their catch they must abide by northern zone regulations.

The topic of discrimination against recreational fishermen in the U.S. fishery management system, particularly NMFS, is one of the concerns voiced by representatives of the sportfishing community in Brielle/Point Pleasant. NMFS seems reluctant to recognize that livelihoods depend on sports fishing too. A charter boat captain and journalist said that he hoped that the U.S. recreational fisheries could be viewed as important as they are in Australia and New Zealand, where their needs are considered first, in the process of determining allowable catches, and what is left is allocated to the commercial fleets. Here, he said, the opposite prevails. A tackle shop

employee and sports angler agreed, but he added that the problem is not just commercial versus recreational: within the commercial fisheries, the larger, more highly organized commercial fisheries, the industrial fleets, get "the cream of the crop," whereas the small businessmen suffer (he has worked as a commercial fisherman too). A party-boat captain noted that industry wide there has been a reversal, the recreational fisheries have been the largest in terms of income for the states, but they are "put on the bottom" in the management process: "In the 20 years I've been going to meetings, we always seem to be dumped."

In the Magnuson-Stevens Act, there is no recognition of recreational fishing communities. People interviewed agreed that this was somehow lost in the rush of getting the Sustainable Fisheries Act through. More generally, there is a tremendous lack of knowledge of the history of these fisheries. And a problem is "that we don't have receipts" to verify how important the catches have been.

The theme of the importance of learning from the fishermen as well as finding ways to respect and use "anecdotal data" came up often in our interviews. A few comments here will indicate the nature of a much longer and more detailed discussion. "This area is the most productive, sailing out of Manasquan Inlet, 50 or 100 miles in any direction." "We know all the canyons, far better than any scientist." "We know, but when we get to these meetings it's ignored, it's almost completely ignored." On yellowfin tuna: "I started the "chunking" fishery out there, in the canyon. You can't go on receipts [to identify what is happening with the fishery]; you have to talk to the people who are there all the time."

The theme of how much "anecdotal" information is disregarded dominated the interviews as well, usually in combination with skepticism about the credibility of scientific work. This has been fueled by events specific to the charter and party boat community, including the discovery that data from the logbooks they are required to fill out was not being entered into databases at the regional office of the NMFS, and discovery that a study contracted by NMFS used data from just 4 charter boat captains as the basis for estimates for the entire region. They also feel strongly that requiring them to fill out logbooks that were designed for commercial fishermen is wrong.

The representatives of this sports-fishing community differ from those who advocate solely catch-and-release fishing, or catch-and-release except for tournaments, as for example in Cape May. Instead, they emphasize the importance, among their clients, of bringing fish home to eat and to share with others, and hence the importance of reasonable bag limits to their ability to continue to serve these clients. The Brielle/Point Pleasant fishermen are concerned that many of the recreational fishing representations who have tried to be leaders in conservation have gone too far in the protectionist, rather than conservationist, direction. Yes, they agree, there's the need to be careful, to protect the fish, but what about livelihoods, the business side? The participants frequently stated that the catch-and-release movement was "spearheaded by an elitist few....." against the interests of "hard working, factory, city people" who came fishing "to fill up their bags with fish and bring them home for the neighborhood." However, even very wealthy people want to bring home some of the fish they catch.

The business side is often neglected by NMFS. NMFS "forgets we're an Entertainment business." Extreme regulations--such as permits, bag limits--drive potential customers away. The extremist position is found in a recent ASMFC news release of a report done in conjunction with the American Sportfishing Association, which reduces the recreational fishing experience to opportunities to catch fish and to tell stories, ignoring the desires of the majority of fishermen also to bring some fish home, not just for price but also to eat and share. One of the large party and charter boat fleets in this port estimates that 85-90% of the over 4 million people they have taken out fishing over the years "wanted to walk home with fish."

For this kind of business, the traditional one for the Mid-Atlantic region, small bag limits are devastating. Customers faced with a choice between a one bluefin bag limit and going to fluke, bluefish, or something else, are likely to choose something else, which is a major loss of income. Inshore fishing is chartered for about $500 per day; bluefin tuna is about $850 per day, a big profit margin. The Brielle/Point Pleasant recreational fishermen also call the extremist position an elitist one, marginalizing as it does the interests of the people who fish from the banks and shores, as well as on party boats and rentals. This also affects tackle shops: "I work behind the counter [at a tackle shop], and I hear it everyday. It's not tangible data, but "tangible impressions." I hear someone talking about bluefin tuna: "I don't bother with that any more, I can't take any home to eat." You can't translate that into tangible data on fish tackle sales, but you know it makes a difference."

The argument for more liberal, "reasonable" bag limits includes the idea that they are necessary to keep people interested in the gambling aspect of the fishery. They do not necessarily translate into larger catches, because if there is not a lot of fish out there, they will not catch it. At least the customers see that there is a possibility.

Another issue of contention is the proposal by the fisheries management agency to increase the size in the “Giant Tuna” category and a recreational tuna category. The proposed increases are to move the large-medium “Giants” from 73 inches to 81 inches and to move a recreational tuna category from 27 inches to 47 inches. The fishermen interviewed questioned the fairness of the regulations and size adjustments. According to the fishermen, the increase both sizes will negatively impact the entire fishery as well as fishery related business. From the fishing perspective, the participants state that, “we do not get enough of that size.” In their opinion, these changes in size jeopardize the fishermen’s ability to book trips and make a living. In looking at the proposed size changes from a business and industry perspective, a respondent said he would loose lots of money from a drop in business and sales. The 27 inch tuna are a big part of the tuna catch in the area and region. By moving the size to 47 inches, which is a size that is less available, the entire fishery along with related businesses and industries would suffer tremendous losses. One tackle shop owner stated the losses his business has incurred since the “school bluefin tuna fishery” was shutdown the week of July 13. Essentially, the shop sold no tackle for this fishery. The tackle has to be order a year in advance for the particular fishing seasons. Now that there is no tackle being purchased, his business loses money and the other bait and tackle shops do too.

Of the sharks, mako sharks are most important. The coastal versus pelagic shark breakdown is irrelevant and misleading. There were two recent shark tournaments in New Jersey, with good weather and good conditions for sharks, and in 250 boat days there was not one single legal sized mako shark. Similar problems on Long Island. Ten years ago, shark tournaments were announced in the winter, and you had to sign up within a month to get in or be on a waiting list. Now there are very few participants. In the early 1980s, they would bring in 200-300 sizeable fish; shark clubs had voluntary size limits; used lotteries. Almost every Mako shark on the menus of restaurants on the Jersey coast came from the recreational fishery; now they are seriously overfished.

CHAPTER 5 - NORTH CAROLINA

STATE PROFILE

Demographic and Economic Characteristics

According to the 1990 U.S. Census, North Carolina has a population of 6,628,637 residents. Educational attainment in North Carolina is such that 70% of the population 25 years and older are high school graduates. The unemployment rate is 4.8% of the civilian labor force. Employment is greatest in the *retail* industry (16%); *manufacturing of durable and nondurable goods* are also important sources of employment for residents of North Carolina. *Agriculture, forestry and fisheries* industries employ nearly 3% of the working residents of North Carolina. The per capita income in 1989 was $12,885.

Fisheries Profile

Bluefin Tuna In 1996, landings of bluefin tuna in North Carolina totaled 14,681 pounds; these landings accounted for less than 1% of the total bluefin tuna landings in the Atlantic and Gulf states in 1996. These North Carolina landings were valued at $98,520 which represents less than 1% of the total economic value of bluefin tuna landings in the Atlantic and Gulf states (NMFS).

Swordfish The 1996 landings of swordfish in North Carolina totaled 175,823 pounds; these landings accounted for nearly 4% of the total swordfish landings in the Atlantic and Gulf states in 1996. The value of these landings was $437,749 which represents nearly 3% of the total economic value of swordfish landings in the Atlantic and Gulf states for 1996 (NMFS).

Large Coastal Sharks The North Carolina landings of large coastal sharks in 1996 totaled 1,818,978 pounds. These landings had a dollar value of $754,165 (NMFS).

Recreational Fishery In 1996, there were 770 saltwater anglers in North Carolina; these anglers account for approximately 8% of the total number of saltwater anglers in the United States that year. Fifty-five percent of those anglers were residents of North Carolina and 45% were nonresidents. There were 5,677 days of saltwater fishing in North Carolina in 1996; these days accounted for nearly 6% of the total days of saltwater fishing in the United States that year. Sixty-five percent of those days were by residents of North Carolina and 35% were by nonresidents (FWS, 1997).

In 1996, expenditures by saltwater anglers in North Carolina totaled $673,291,743; this accounted for nearly 8% of the total U.S. expenditures by saltwater anglers that year. Saltwater fishing in North Carolina had an economic output of $1,285,277,129 (5.1% of the U.S. total), generated wages and salaries of $356,590,362 (5.4%) and created 19,379 jobs (6.7%) (ASA, 1997).

MAJOR NORTH CAROLINA HMS AND BILLFISH COMMUNITIES

Demographic Characteristics

The communities in North Carolina likely to be affected by Fishery Management Plans are found in Table 5.1. The population sizes of these communities from the 1990 Census range from 55,530 residents in Wilmington to 991 in Mateo. There was considerable variation in the gender ratios for these communities, with Atlantic Beach having the greatest ratio of males to females (1.15), and Beaufort having the smallest gender ratio (0.81). The percent of people age 15 to 44 years was found to be lowest in Beaufort (41%) and highest in Wrightsville Beach (56%). The percent of married family households among the communities tended to range a bit more widely. Approximately 39% of Wilmington's households were occupied by married families; at the other end, Harkers Island had a household composition that featured 73% married couple households. School enrollment was highest in Wanchese and Wilmington, two communities with very different population and household structures; school enrollment was lowest in Manteo and Nags Head.

Demographic data was not readily available for two North Carolina communities - Manns Harbor and Oregon Inlet. While Manns Harbor is considered a populated place, Oregon Inlet is identified as a number of geographic landmarks. However, on the landings data from NMFS the port city is listed as Oregon Inlet, indicating that the fishers there identify actual port, rather than the community in which it is located.

Economic Characteristics

Unemployment rates in the top communities for North Carolina are found from 2.4% in Harkers Island to 8.1% in Beaufort. Income per capita is much higher in Wrightsville Beach ($29,722) than in the other communities, which then range from Harkers Island ($9,505) to Atlantic Beach ($19,373).

The fishing industry is quite prominent in Wanchese; this importance can be derived from the 20% of the community's workers employed in agriculture, forestry and fishing in 1990. Other communities with considerable employment in these industries are Harkers Island (8% of the working population) and Hatteras (6%). Swansboro, Wrightsville Beach and Wilmington have the lowest percent of workers in these industries; these range from 1-2% of their employed population.

Fisheries Characteristics

Table 5.2 gives 1996 landings and permit information for the communities in North Carolina likely to be affected by Fishery Management Plans.

Bluefin Tuna In 1996, landings of bluefin tuna in North Carolina were highest in Wanchese, 6215 pounds (dry weight). Beaufort had the next largest bluefin tuna landings with 3,479 pounds in 1996. Harkers Island, Hatteras and Morehead City each had bluefin landings just over 400 pounds in 1996. The North Carolina ports have more recreational tuna permits than commercial tuna permits. Hatteras, Morehead City and Atlantic Beach have the greatest number of commercial permits. With 368, Morehead City is far ahead of other communities with recreational tuna permits.

Swordfish In North Carolina, Wanchese has the largest swordfish landings for 1996 with 674 pounds (dry weight). Manteo also had sizable swordfish landings for 1996.

Large Coastal Shark Wanchese and Manteo had the most substantial landings for large coastal sharks in 1996, with 612 and 555 pounds (dry weight), respectively. Hatteras and Nags Head also had notable shark landings over 100 pounds.

TABLE 5.1
NORTH CAROLINA COMMUNITIES AFFECTED BY FISHERY MANAGEMENT PLANS
DEMOGRAPHIC CHARACTERISTICS
Source: U.S. Bureau of the Census

Community	1990 Census Population	Sex Ratio M/F	% Married Family Households	% of High School Graduates Age 25 and over	Civil Unemployment Rate	1989 Per Capita Income	% Agriculture, Forestry & Fisheries Industry
Atlantic Beach	1,938	1.14	48.6	85.1	3.1	$19,373	2.9
Beaufort	3,808	0.81	44.3	75.1	8.1	$11,385	3.0
Harkers Island	1,761	1.01	73.4		2.4	$9,505	8.2
Morehead City	6,046	0.83	40.3	70.6	6.4	$11,410	3.0
Hatteras	2,675	1.07	59.1	74.4	4.2	$12,796	6.4
Manns Harbor*							
Manteo	991	0.94	44.3	76.1	4.0	$13,068	3.8
Nags Head	1,838	1.01	53.7	83.5	3.3	$17,295	2.4
Oregon Inlet*							
Wanchese	1,374	1.05	62.6	67.3	10.0	$10,830	19.7
Swansboro	1,165	0.86	52.6	90.1	5.6	$12,919	1.8
Wilmington	55,530	0.82	38.6	73.1	6.3	$12,077	1.0
Wrightsville Beach	2,937	0.99	40.3	95.6	3.0	$29,722	1.6

TABLE 5.2
NORTH CAROLINA COMMUNITIES AFFECTED BY FISHERY MANAGEMENT PLANS
FISHERIES CHARACTERISTICS
Source: NMFS

Community	Bluefin Tuna Landings *dry wt in lbs*	Bluefin Tuna Landings *rank*	Commercial Tuna Permits *number*	Commercial Tuna Permits *rank*	Recreational Tuna Permits *number*	Recreational Tuna Permits *rank*	Swordfish Landings *# of fish*	Swordfish Landings *rank*	LC Shark Landings *# of fish*	LC Shark Landings *rank*
Atlantic Beach			69	3	167	2				
Beaufort	3,479	2	24		64	8	1	7	19	7
Harkers Island	410	5	28	9	67	7				
Morehead City	433	3	82	2	368	1	1	7	19	7
Hatteras	429	4	83	1	71	6			135	3
Manns Harbor			5		1		34	3	54	5
Manteo			29	8	32		236	2	555	2
Nags Head			6		19				100	4
Oregon Inlet			23		15		13	5	45	6
Wanchese	6,215	1	39	4	8		674	1	612	1
Swansboro			24		75	5				
Wilmington			32	6	111	3				
Wrightsville Beach			36	5	84	4	33	4		

HATTERAS COMMUNITY PROFILE

Hatteras Village is a rural community at the southern end of Hatteras Island on North Carolina's Outer Banks. Hatteras Island is the “classic example” of a dynamic barrier island, which is bordered by the Atlantic on the east and Pamlico Sound on the west. Noted for it’s vast marine resources, the area is also an important point of departure for marine vessels, and has historically been considered a strategic location on the coast of North America during war (CNCSS, 1993).

Geographic isolation adds to the local character of Hatteras. Respondents said that it is a place where people feel safe. Some people leave their houses unlocked. It feels safer because it is an isolated island community. A ferry leaves Hatteras to go to neighboring Ocracoke Island. Usage of the ferry is very in the summer when you can bet get cars backed up for a half a mile. The village is quite and insular and "made up of a lot of people who came here to get away from something."

DEMOGRAPHIC PROFILE

Population

The 1990 Census population for Hatteras Township is 2,675; Hatteras Township consists of the communities of Avon, Buxton, Frisco and Hatteras. Fifty-two percent of this population consisted of men, and 48% were women.

Racial and Ethnic Composition

The racial composition of Hatteras is largely White (99%) with less than one percent each of Black and American Indian races. In the past and as well as today, Hatteras only has small populations of ethnic minorities. The most frequently cited single ancestries in Hatteras were English and United States ancestry; the ancestry of the community is of predominantly European descent.

Age Structure

Forty-five percent of the population of Hatteras were between 15 and 44 according to the 1990 Census. There were nearly twice as many people over forty-four (36%) in Hatteras as there were people under fifteen (19%).

Marriage

In Hatteras, 66% of the population over 15 is currently married. Of those who are not married, 21% have never been married, 6% are widowed and 7% are divorced. While only 17 men in Hatteras are widowed, 108 women in Hatteras are widowed. Differences in marriage status between the sexes is also evident in that 121 men and only 41 women in Hatteras are divorced.

Household Composition

The 1990 Census reports 1,078 households for Hatteras with an average of 2.38 persons per household. Nearly 70% of these households are family households; fifty-nine percent of all households are married couple family households. Approximately thirty percent of all

households are with children under 18, while nearly 19% of all householders are over 65. Table 5.3 shows characteristics of the household composition.

TABLE 5.3 HOUSEHOLD COMPOSITION HATTERAS, NC Source: U.S. Bureau of the Census	
Total Number of Households	1,078
Average Number of Persons per Household	2.38
Percent of Married-couple Family Households	59.1
Percent with own children under 18	25.3
Percent of Male Householder Family Households	1.6
Percent with own children under 18	0
Percent of Female Householder Family Households	9
Percent with own children under 18	5
Percent of Non-family Households	30.3
Percent of Householders Sixty-five or older	18.5

In 1990, there were a total of 1,861 housing units in Hatteras, as reported by the US Census. Fifty-eight percent of these housing units were occupied; of these, 798 were owner occupied and 279 were renter occupied. There were 784 vacant housing units in 1990, 63% of which were utilized seasonally. Table 5.4 gives additional housing information for Hatteras.

TABLE 5.4 HOUSING INFORMATION HATTERAS, NC Source: U.S. Bureau of the Census	
Total Housing Units	1,861
Owner-occupied Units	798
Median Value	$109,000
Renter-occupied Units	279
Median Contract Rent	$334
Vacant Housing Units	784
Housing Units Vacant for Seasonal Use	490

Educational Trends

In Hatteras, 74.4% of the population 25 and over are high school graduates. Table 5.5 shows the educational attainments of this population.

TABLE 5.5
EDUCATIONAL ATTAINMENT
(PERSONS 25 AND OLDER)
HATTERAS, NC
Source: U.S. Bureau of the Census

	# of Persons	% of Population 25 years and older
Less than 9th grade	128	7.1
9th to 12th grade, no diploma	335	18.5
High school graduate (includes equivalency)	615	34.0
Some college, no degree	303	16.8
Associate degree	55	3.0
Bachelor's degree	265	14.7
Graduate or professional degree	107	5.9

Cape Hatteras School in Buxton is the educational facility utilized by school aged residents of Hatteras; this facility provides schooling for all levels from kindergarten to the twelfth grade. The school also serves as a forum for interaction by the members of the communities on the island (CNCSS, 1993).

Economic Characteristics
In the 18th century, Hatteras established itself as a seaport community, where activities included whaling and exporting/ importing. However, due to the dynamics of the barrier island geography, Hatteras Inlet was closed in 1764, only to be opened up again during a large storm in 1846 (CNCSS, 1993). Since World War II the economy of the Hatteras community has depended on charter and commercial fishing as the major sources of local income; tourism also serves as an important economic activity.

Seasonal variation in the local economy of Hatteras is due to the presence of three “seasons” (CNCSS, 1993). In the spring, revenue begins to pick up during weekend and holiday tourism; it is during this period of time (April to May) that approximately 30 boats from the commercial fleet become active in charter fishing. The second season, approximately June through August, begins when schools let out for the year and family vacations are frequent. The third “season” is the fall, when fishing, surfing and windsurfing are the dominant activities.

Income The per capita income for Hatteras according to the 1990 Census is $12,796; this approximately the same as the state per capita income ($12,885) Compared to the community at large, only a few commercial fishermen have had considerable financial success; business owners in the fishing industry, such as marina and restaurant owners, have been relatively financially successful (CNCSS, 1993).

Employment In Hatteras, the labor force consists of approximately 70% of the 2,109 people over 16 years old (Census, 1990). Armed forces employees make up nearly 3% of the labor force. There are 1,378 civil employees; 58% are men and 42% are women. The unemployment rate in Hatteras is 4.2% of the civilian labor force.

In Hatteras, 57% of employees are *private for profit wage and salary workers*. Tourism and recreation are major industries in Hatteras in terms of employment (CNCSS, 1993). Commercial fishing is also a major occupation on Hatteras Island, where there are approximately 500 to 600 part and full time commercial fishermen; recreational fishing is a source of seasonal employment (CNCSS, 1993). According to the 1990 Census, twenty-one percent of employed persons work for the local (8%), state (7%) or federal (6%) government; these public sector jobs include ferry workers (CNCSS, 1993). *Self-employed workers* make up 16% of the employed work force.

When combined, *managerial*, *professional*, *technician*, and *administrative* jobs account for nearly half of the occupations reported in the 1990 Census. *Farming*, *forestry* and *fishing* jobs are held by 6% of those employed in Hatteras.

Employment by Industry In Hatteras, *retail trade* is the largest industry sector with respect to number of workers, accounting for 26% of the employed persons over 16 years old . *Construction* (16%) and *professional and related services* (11%) industries are also important employers. *Agriculture, forestry and fisheries* industries employ 6% of Hatteras's employed work force. Table 5.6 gives additional information on the industries in Hatteras from the 1990 Census.

TABLE 5.6
EMPLOYMENT BY INDUSTRY
(EMPLOYED PERSONS 16 YEARS AND OVER)
HATTERAS, NC
Source: U.S. Bureau of the Census

Sector	# Employed	% Employed
Agriculture, forestry, and fisheries	**88**	**6.4**
Mining	0	0
Construction	223	16.2
Manufacturing, nondurable goods	21	1.5
Manufacturing, durable goods	26	1.9
Transportation	55	4.0
Communications and other public utilities	34	2.4
Wholesale trade	37	2.7
Retail trade	359	26.0
Finance, insurance, and real estate	109	7.9
Business and repair services	16	1.2
Personal services	134	9.7
Entertainment and recreation services	16	1.2
Professional and related services	156	11.3
Public administration	104	7.6
Total	1,378	100

Fishing Related Businesses In Hatteras there are five seafood wholesalers and one retail market; there are three marinas (GTE yellow pages, 1998). Businesses in surrounding communities such as Manteo and Buxton also add to the marine economy.

FISHERIES PROFILE

Hatteras Village is almost totally dependent on fishing. While non-fishing tourists, especially windsurfers, are attracted to beaches elsewhere on the island, Hatteras Village's own beaches are less appealing. Tourists come to Hatteras because they want to fish. Our oldest respondent told us that when he was growing up the only thing to do was fish. He remembers one morning, fifty years ago, counting some 260 boats going out of the harbor. They were gillneting for trout and croakers and "caught a lot more fish than is being caught now." The recreational and charter fishing industry's history is just as proud. The wall of one charter boat office is covered with captioned pictures displaying the history of the Albatross Fleet. In 1937, the four sons of a commercial fisherman went into the charter business. Their first sailfish was caught in 1940. Tarpon and dolphin began in 1940. They hired a publicist to spread the word about big game fishing in Hatteras. They caught their first marlin in 1951. In 1952, the first blue marlin was

caught by a lady. In 1962, The Albatross III caught a world record, 810 lb blue marlin. The headline on a yellowing copy of a 1958 New York City newspaper article proclaims the shocking news of an "Angler Deliberately Releasing a Blue Marlin!" (Hurley 1958). The angler was Jack Cleveland of Greenwich CT fishing on the Albatross.

Marinas and Charters

A charter boat captain related that newcomers are amazed at how good the fishing is. Ditton et al. (1998) did a survey of both private and charter boat anglers in Hatteras in the winter of 1997. Their results support the captain's assertion. They found that of 644 anglers, 46 percent agreed with the statement "I caught more fish than I expected on this trip" and 42 percent agreed that they "could not imaging a better fishing trip." The winter season is bluefin tuna. In early spring they get puppy drum on the beach, and offshore yellowfin tuna, dolphin, wahoo and marlin. Sailfish come in June. In the summer with the warm water they get "all fish": flounder, cobia, speckled trout, drum, wahoo, marlin and sailfish. In the fall are flounders, king mackerel and rockfish.

The marinas are 100 percent fishing related. Over the course of the year most people come to fish with their boats, both trailer boats and over water boats. A marina owner estimates that half of the parties are all men and about half families. The families go to the beach, the shops, and amusements such as go cart tracks. The winter bluefin tuna fishing brings a greater percentage of the trips to the charter fleet In their census of fishing trips during the bulk of the 1997 winter season, Ditton et al. (1998) found only 27 percent of bluefin tuna fishing trips were in private boats and the rest in charter boats. Ditton et al. (1998) found 51 charter boats in Hatteras in January.

Make up charters, where marinas organize the parties, are becoming more and more common. A captain estimated that his marina did 140 make up charters in the past year. The majority of the charter customers are after a good experience with offshore fishing. One captain, who has been chartering for many years, believes that the motivations of the charter customers are changing. He describes the current group as people who want to get way from city jobs and have fun with something really different. A lot of them are outdoorsmen in other areas. The fishing puts them in touch with wild creatures. The "game hogs," meaning those primarily interested in getting a lot of "meat," have dwindled. He sees the customers as will to accept limits when they are imposed. Often they are more willing to accept limits than people who have fished all their lives. Meat, however, is still an important motivation for all anglers except for billfish anglers. In fact, another captain, who does about a quarter of his business on billfish, sees the growing catch and release ethic as having reduced angler interest in marlins.

Captains say it is very hard to find a year round mate. The college students who work in the summer can make more money when they graduate. It’s a good lifestyle for a college student, but to find someone year round they have to like to fish. These are more skilled fishers and they want their own boats. One captain said that "of the boats that are fishing year round, you can bet that the mates that they have are looking for a boat to fish in the future." He estimates that about one in five mates are married and supporting a family.

Changes in fishing affect charter bookings almost instantly. Within a couple of weeks after a fish species is gone the marinas will start to get cancellations. Charter customers show little loyalty to North Carolina as a place to fish. Ditton et al. (1998) found that less than a majority of charter boat anglers (44 percent) opposed restricting NC fishing to benefit other parts of the coast, while a majority of the private anglers (57 percent) opposed the measure. They also found that anglers from NC were more likely to oppose the measure.

Because Hatteras attracts top sport fishers from around the world, the issues of minimum sizes and trophy fish take on special significance. One captain, by his account and that of others, attracts people who come specifically to fish for world records. They are interested in setting records by catching smaller bluefin tuna on fly rods. In 1997 fishing for fish between 27" and 73" was closed on March 2nd. Between, March 5th to March 18th, he had four different groups of people coming to fish for bluefin tuna for world records; and they all canceled because they could not keep a world record fish even if they caught it. Few anglers want to release bluefin tuna. Ditton et al. (1998) found that 60 percent opposed catch and release only for bluefin tuna. Keeping trophy fish "means a lot to someone who has paid a thousand dollars to go out fishing" the marina owner said.

The "charter business is not native sons any more" said one respondent. A captain estimated that where the village had 15 charter boats ten years ago there are now 40. These are the charter boats that stay here all year round. Transient charters come for the "cream of the crop," particularly the bluefin season. Ditton et al. (1998) found 51 charter boats in the village during the 1997 bluefin season. There is tension between the local charter boats and the transient charters because of increased competition for both fish and customers. One new charter boat is a state-of-the-art luxury boat with fish finding electronics, a stereo, a microwave and air conditioning. The locals argue that he could get $1500 a day but instead charges but a little more than the going rate. He has announced that he intends to take business from people. However, they say that the charter fleet has not reached a saturation point and that the customers are still happy. The charter captains say they generally work well together. There is also tension with private recreational fishers who following the charter boats to see where they fish.

Another long-time, local fisherman is running two party boats. He is finding more and more ways to make the party boat a family excursion. He does pirate trips and other special off shore trips. He also does birding trips.

Tournaments

The Hatteras Village Civic Association holds three tournaments a year. Tournaments attract people for the prize money and the social events that surround them. The biggest in the area is the Big Rock tournament the first week in June. The present tournament is three days and many boats fish out of Hatteras. One marina manager, interviewed just after a tournament in May, reported that the tournament attracted 9 boats. This was an increase of a third over the year round boats. Also in May is a tournament at another marina and one at a private club. Tournaments are in May because it is otherwise a slow month. There is also a king mackerel tournament in the fall,

Recreational billfishing in Hatteras is described by respondents as totally catch and release. The only exception, and it is an important one, is large tournaments. There are seven such tournaments in North Carolina that are too large and if these tournaments were not allowed to kill fish it would have a negative impact on all businesses related to recreational fishing. The biggest tournament directly affecting Hatteras is the Big Rock in Morehead City. Many boats in this tournament fish out of Hatteras. The blue marlins being killed in tournaments are 110" inches. Respondents disagree about the affect of a 113' size limit on these tournaments, but 113" inches is tending toward a rare event. It would make it possible that a tournaments would not catch any fish. The tournament at the private club in Hatteras is a total release tournament and has been for five years. However, it is for a trophy only. The organizer says that they lost a few people when they shifted to total release, but they picked up even more. In his estimation, more people don't want to kill than do. The scales at the club are rusted out, they couldn't weigh fish in any case.

The Winter Atlantic Bluefin Tuna Fishery

Perhaps the most pressing issue for highly migratory species in Hatteras is the status of the relatively new winter fishery for bluefin tuna. In their study of the 1997 bluefin tuna fishing season, Ditton et al. (1998) found that bluefin tuna anglers spent $3.6 million dollars in Hatteras in two and one-half months in the 1997 winter season. They estimate that this meant a $7.6 million increase in the output of the Hatteras area economy which supported 170 jobs. Dare County, the lowest level for which North Carolina Employment Security Commission figures are available, had an average of 1963 people on unemployment in the first quarter of 1997. This represents 14 percent of the workforce. In contrast, they had an average of 320 people on unemployment from June through August of 1997. Following these estimates, the bluefin tuna fishery reduced unemployment in Dare County by eight percent. These jobs, however, would tend to be concentrated in the Hatteras area, not spread across Dare County. Although no figures are available just for this area, it is reasonable to conclude that the impact of the winter bluefin tuna fishery on local employment is very substantial. A marina owner reported that his receipts for March 1997 after the quota closed were down $100,000 compared to March of 1996 when anglers could still land bluefin tuna. Unemployment in Dare County in March of 1998, a year when the bluefin tuna had left earlier than in 1997 was 29 percent higher than in March of 1997. Some of this must be attributable to the early disappearance of the fish.

Respondents view and respond to the winter fishery very differently. They even disagree about when it started. One offers this account: "The first year (in her account, 1996) of the winter fishery people did not believe what was happening. They were hesitating making any changes in response to it. Lots of people liked to go away in the winter anyway. The second season people related to it as a bonanza. Lots of investment and talk about expansion. The third season it began to collapse. People had become dependent thinking that they would always have a twelve month season." Our oldest respondent does not think anything new is going on, he, and several others, think that it is just the natural variation in the presence of fish. Still others are unhappy to see the new influx of tourists. They say only the business people care. The rest of the community was perfectly happy to have a quiet winter and see the tourists go home. Another respondent criticized all the hype. "It is true" she said "that there has been an increase in visitors and money is coming in but the change has not been that substantial. Some articles make it sound like

Hatteras was asleep and suddenly woke up. A couple of restaurants and hotels have stayed open but many people in the service industry have remained unemployed."

Those who now have winter jobs, and those who hire them, have different perspectives. One woman now has employment all year round after ten years at a seasonal restaurant job. "Before the bluefin the whole village shut down." One charter captain, who happens to be skeptical about the future of the winter fishery, said that it has had a substantial effect on the life style of the charter boat captains. Before the winter fishery they would live in the winter and early spring on their deposits for the following summer. It also helps employers with their problems finding and keeping employees. Looking for people that can do a job right is always a problem, a marina owner related. Now you can hire people year round. This makes it easier to hold on to good people and avoids the hassle of finding and training people all the time.

Others wonder about the long term effects of these kinds of jobs. One respondent pointed out that these are all service and tourist jobs where people make minimum wage or just above. At the same time rent and property costs are high and are becoming higher as Hatteras become an increasingly popular destination. She is concerned about where the children of working people living here will be able to find a job or a piece of property. Finding a place on Hatteras Island for a low wage worker to live is already difficult. One marina has turned a store room into a dorm for its seasonal workers.

Many people don't think the winter fishery will last. This is particularly true of the fishing professionals. There have been people from other areas who came here because of hype about a year round business. One businessman said that he needs the bluefin tuna to stay around for seven more years to repays the loan he used to buy a fishing-related business two years ago. He had been looking at this deal and decided against it, but a year later, with the bluefin tuna in the picture, he decided that he could make a go of it.

Commercial Fishing

Commercial fishing in Hatteras is very similar to the small scale fishery described in the Wanchese profile. The only active commercial fishing organization is the Hatteras-Ocracoke Auxiliary of the North Carolina Fishermen's Association, which has been organized since 1992. In the current Hatteras fleet there are 5 boats of the 35 or so small gill net boats that go shark longlining during the shark season. They lost income through shark closings and quotas. Some have incidental permits for the bluefin tuna but they cannot reach the incidental matching ratio. Others have general category permits, but that season opens after the fish have passed. These small boat fishers are dependent on a very diverse fishery. What disturbs them the most is the possibility of limited entry systems. They fish five or six species a year but do not always fish the same ones every year. What scares them is that they will not be fishing sometime when landings are counted for some system based on current participation.

FISHERIES MANAGEMENT ISSUES

Other Comments Offered by Respondents

Fisheries management is a divisive issue in Hatteras Village. It has exacerbated the tensions between the long term, local charter boats and the private yachts. Some see these "hobbyists" as

the ones who are dominating fisheries management. One charter captain said that management is "contaminated by people who buy a magazine, join CCA and go fishing. Then dominate the dialogue about offshore sports fishing. The sportfishing magazine editorials are dominated by the hobbyists. This is the embittering part..in what other industry are the hobbyists the experts." The professionals, he says, are the ones who are able to be balanced between commercial and recreational interests. Other observations, however, don't entirely bare this out. It was a recreational supply professional that said that "the problem is that NMFS is controlled by commercial lobbyists." The individual recreational anglers that Ditton et al. (1998) interviewed are not particularly hostile to commercial fishers. They found with an open response question that only 13 percent of anglers listed commercial fishing as one of the most critical issues facing bluefin tuna management. This is a position at variance with much of the leadership of the recreational community. NMFS has developed a legitimacy problem in Hatteras. Most importantly because they mistook a census of bluefin tuna catches for a sample and this led to the inappropriate closure of the quota. This made Hatteras fishers very upset and many do not believe that it was a mistake. Several tense meetings with fisheries professionals have "poisoned the well in regards to fishermen wanting to help with research. Whatever we do we get done in by sharpies with degrees." A charter captain was asked what would it mean if he had to keep a log book for NMFS. He replied "It would be a pain. I would be supplying the federal government with data I couldn’t trust them to use properly. "

WANCHESE COMMUNITY PROFILE

Wanchese is located on the southern part of Roanoke Island, located in the northern Outer Banks. This small fishing village is said to have "changed as little as those who have lived here for generations" (Cutchin, 1997). Although ultimately unsuccessful, the first American colony was Roanoke Island; today, a local theater group's re-enactment of this historical event is a popular tourist attraction (CNCSS, 1993). The village actually received its name from a Native American leader named Wanchese who greeted these first English settlers in 1584; Wanchese was officially named when the federal postal system was established in 1886 (Cutchin, 1997).

Throughout the nineteenth century, the commercial fishing industry expanded, due in part to the involvement of the first postmaster (CNCSS, 1993). This postmaster owned or financed most of the commercial fishing boats in Wanchese; he also established a system of credit for the fishermen at his store, which was paid off when they brought in their catches. During that time, almost all of the residents of Wanchese were commercial fishermen. Today the village still revolves around fishing, but has expanded to include processing plants. Though traditionally a commercial fishing community, recent growth in tourism and recreational fishing has sparked competition between the new and the old for a restricted resource.

Wanchese's first fish house was begun in 1936 by the grandfather of the current generation that still runs two fish houses in the community, one of which related this history. His son fished the first trawler in Wanchese in the 1950s. He took a little 65' wooden boat and converted it into a fishing trawler. The grandfather stayed and helped packing boats but he was a gillnetter at heart and would rather be catching fish. In those days they were fishing more in Pamlico and Abermarle Sounds than in the ocean. They beached fished for sea mollusks, trout, croakers, spots, striped bass, and bluefish. In the Sounds they fished croakers, butterfish, Spanish mackerel, spots, and pigfishes. With the trawler they began flounder fishing in the winter. Then they would go offshore and catch some sea bass later in the year. They bought another similar boat and then a WWI converted subchaser. The subchaser was the first boat to try scalloping. The owner of a third fish house built the first flynet in 1971.

DEMOGRAPHIC PROFILE

Population

The 1990 Census population for Wanchese to be 1,374 residents; however, this count is not entirely accurate since the Census includes Nags Head and Roanoke Island with Wanchese (CNCSS, 1993). This population consisted of 51% men and 49% women. Population estimates since 1990 were not readily available for Wanchese.

The relative absence of seasonal change in population for Wanchese departs from the normal pattern of seasonal variation found in the surrounding communities. Since commercial fishing is central to the economy of Wanchese, it does not see the shifts in population that occur due to tourism in the summer months (CNCSS, 1993).

Racial and Ethnic Composition

In 1990, the population of Wanchese primarily consisted of White residents (98%), although a little over 1% of its residents were American Indian. The ethnic composition of Wanchese is primarily European ancestry; nearly 29% of the residents of Wanchese claim United States ancestry.

Age Structure
Forty-six percent of the population of Wanchese are between the ages of 15 and 44 years old. The even age structure is shown by the nearly equal percentage of young and old - 26% below 15 years and 27% above 45 years.

Marriage
In Wanchese, 18% of the population over 15 has never been married. Nearly 69% of the population is currently married. Less than 5% are widowed; approximately 8% are divorced.

Household Composition
According to the 1990 Census, there are 503 households in Wanchese which have an average of 2.69 persons per house. Nearly 63% of these are married couple family households. Of the family households without married couples, three percent are family households with male householders and eleven percent are family households with female householders. The remaining 24% of households are non-family households. Table 5.7 gives additional household information for Wanchese.

TABLE 5.7
HOUSEHOLD COMPOSITION
WANCHESE, NC
Source: U.S. Bureau of the Census

Total Number of Households	503
Average Number of Persons per Household	2.69
Percent of Married-couple Family Households	62.6
Percent with own children under 18	36.0
Percent of Male Householder Family Households	2.6
Percent with own children under 18	2.6
Percent of Female Householder Family Households	10.9
Percent with own children under 18	6.0
Percent of Non-family Households	23.9
Percent of Householders Sixty-five or older	14.3

There are 583 housing units in Wanchese, of which 88% are occupied. Of the vacant housing units, 14% are vacant due to seasonal usage. Table 5.8 shows additional housing information from the 1990 Census.

TABLE 5.8 HOUSING INFORMATION WANCHESE, NC Source: U.S. Bureau of the Census	
Total Housing Units	583
Owner-occupied Units	384
Median Value	$75,200
Renter-occupied Units	129
Median Contract Rent	$320
Vacant Housing Units	70
Housing Units Vacant for Seasonal Use	10

Educational Trends

In Wanchese, sixty-seven percent of the population 25 and over are high school graduates, according to the 1990 Census. Educational attainment for Wanchese residents are shown in Table 5.9.

TABLE 5.9 EDUCATIONAL ATTAINMENT (PERSONS 25 YEARS AND OLDER) WANCHESE, NC Source: U.S. Bureau of the Census		
	# of Persons	% of Population 25 years and older
Less than 9th grade	85	10.8
9th to 12th grade, no diploma	172	21.8
High school graduate (includes equivalency)	259	32.9
Some college, no degree	170	21.6
Associate degree	40	5.1
Bachelor's degree	32	4.1
Graduate or professional degree	29	3.7

The only educational facility located in Wanchese is the private Wanchese Christian Academy, founded by the Wanchese Assembly of God members in the 1970s (CNCSS, 1993). Public schooling is found at the Dare County schools in Manteo; this school system has elementary, middle and high school facilities. The College of Albemarle has a satellite campus in Manteo; secondary education offered by the college at this site includes a boat-building course (CNCSS, 1993).

Fishing Associations

Fishing related associations include the Oregon Inlet Users Association and the North Carolina Fisheries Association. The former is involved with supporting the plans for jetties at Oregon Inlet; they are responsible for organizing both the Wanchese Seafood Festival and the Blessing of the Fleet. The latter is a trade organization of seafood dealers and commercial fishermen from the state; two members of the 18 member Board of Directors are from Wanchese (CNCSS, 1993).

Economic Characteristics

Income The 1989 per capita income for Wanchese was $10,830. This is below the state per capita income ($12,885) and the per capita income for Hatteras ($12,796).

Employment Trends Of the 984 Wanchese residents 16 years old and over, 85% participate in the civilian labor force. The unemployment rate is 10.0% of the civilian labor force; of this unemployment rate, 2% consists of male unemployment and 8% is female unemployment.

Of the employed work force in Wanchese, approximately 57% are men and 43% are women. The number of working women has been on the rise, due in part to the increase in opportunities for women outside the home created by tourist businesses in the beach communities surrounding Wanchese (CNCSS, 1993).

According to the 1990 Census, 61% of the working population in Wanchese is employed in private for profit jobs. Jobs in the private sector are largely related to the area's commercial fisheries (CNCSS, 1993). Most of these workers are self-employed; the Census figures show that nearly 19% are self-employed workers. Government jobs are considered desirable due to the security and consistency in contrast with the fishing industry (CNCSS,1993); figures from the 1990 Census show that nearly 17% of the workers are employed with the local, state or federal government.

Employment by Industry Nearly 20% of the employed persons over 16 in Wanchese are working in the *agriculture, forestry and fisheries* industries; this is the highest rating industrial sector for employment. These industries are followed by *retail trade* (19%) and *professional and related services* (16%) in terms of employment of Wanchese residents. *Farming, forestry and fishing* occupations are held by nearly 19% of the Wanchese employed population. Other prevalent occupations are *technician and administrators* (25%) and *managers and professional* (17%). Table 5.10 shows the role of industry as an employer in Wanchese.

Unlike the surrounding communities, Wanchese has very little seasonal variation in employment resulting from tourism; what seasonal fluctuations do exist are caused by the availability of the fisheries resources and are countered by the flexibility and opportunistic nature of the Wanchese fishermen (CNCSS, 1993). This flexibility is now being threatened; this is addressed below. However, the tourism industries in the surrounding communities do provide seasonal employment opportunities to residents of Wanchese.

TABLE 5.10
EMPLOYMENT BY INDUSTRY
(EMPLOYED PERSONS 16 YEARS AND OVER)
WANCHESE, NC
Source: U.S. Bureau of the Census

Sector	# Employed	% Employed
Agriculture, forestry, and fisheries	**137**	**19.7**
Mining	0	0
Construction	35	5.0
Manufacturing, nondurable goods	9	1.3
Manufacturing, durable goods	57	8.2
Transportation	17	2.4
Communications and other public utilities	9	1.3
Wholesale trade	46	6.6
Retail trade	133	19.1
Finance, insurance, and real estate	23	3.3
Business and repair services	25	3.6
Personal services	27	3.9
Entertainment and recreation services	20	2.9
Professional and related services	112	16.1
Public administration	46	6.6
Total	696	100

Fishing Related Businesses There are approximately 117 small businesses in Wanchese, 44 of which are commercial or charter fishing businesses (CNCSS, 1993). Some of the more prominent local businesses are described below. Support industries, such as boat builders and seafood packers, are also of great importance to the commercial fisheries.

There are three major fish houses in Wanchese. One, which specializes in scallop and flounder, has fourteen boats which include trawlers, scallop boats and smaller boats for gill netting as well as two scallop boats in Alaska (CNCSS, 1993). They have three packaging and processing houses, a fish-packing house and a processing and freezing operation; These are located in North Carolina, Virginia and Massachusetts. Seafood is distributed locally and nationally by truck and internationally by air freight. The second, which specializes in hooked fish, is an important seafood distributer; this company is the most affected by this FMP. While only operating one boat, this company buys regularly from 35 local and over 70 non-local boats. The third, which specializes in bulk fish, packs the fish from its own two vessels; transportation of their product is set up through an agreement with the Wanchese Fish Company (CNCSS, 1993).

The Wanchese Seafood Industrial Park was constructed in 1980 by the state; it is operated by the North Carolina Department of Commerce. According to the brochure put out by North Carolina Power in 1995, the park has, among other features, “30 acres of leasable land,” “a 15-acre deep water harbor,” and “1,500 feet of commercial-style concrete docks.” There are currently seven seafood related businesses located at the park (CNCSS, 1993).

Part of the Wanchese Seafood Industrial Park project were plans for inlet stabilization. Originally, the seafood park that now takes up half of the newly expanded Wanchese harbor was voted down by the people in the community. The reason they finally put it in was because of the issue of a jetty for Oregon Inlet, which is the most direct route for Wanchese boats to get to open ocean. The state argued that if they were going to spend a hundred million dollars on a jetty the federal government should dredge the harbor, as part of the agreement of the Mateo (Shallowbag) Bay Project (CNCSS, 1993). At that time, the harbor was half as wide as it is now. They dredged it out and piled the spill in the area which is now occupied by the park. They put a cement dock in as well. The state essentially came back to the Wanchese community and said if you want a jetty at Oregon Inlet, you have to have the seafood park first. At first they revolted and then acquiesced because of the importance of the Inlet. They had been trying to get the jetty since the 1950s. Ironically, they still haven’t gotten it jetted. The industrial park is also the scene of the annual blessing of the fleet, which is put on by the Oregon Inlet Users Association.

FISHERIES PROFILE

Wanchese as a Multispecies Fishery

A central fact about fishing in Wanchese's is the large number of commercially important species that they catch. Many respondents emphasized how they have to be versatile to survive, particularly because they face quick changes in water temperatures. They suggest that Wanchese is much more of a mixed fishery than in the north where people can fish the same species year round. Among the highly migratory species they fish for swordfish, shark, and tuna. Yellowfin tuna is particularly important but they also catch bigeye and bluefin tuna. Because of the weather, summer is the time that they tunas and swordfish are accessible to the medium sized boats that can both gillnet and longline, and late summer is a slow time for everything else. A captain of one of these medium size boats, however, said that he would prefer to stick with shark fishing year round because of the danger of going for tuna and swordfish farther off shore. They gillnet for dogfish, bluefish, Spanish mackerel, trout, and croakers. The latter two are important in the winter and the Spanish mackerel is important in the spring and fall. They bottom fish for bass and grouper. There are a number of gillnet boats that switch over to charter fishing in the summer. Large trawl boats fish for squid in the summer and a smorgasbord of weakfish, croaker, and flounder in the winter. Squid requires them to travel north. There are now less than fifteen of these trawl boats that stay at Wanchese. The biggest shark months are April to June but their quota is in January and July. Medium sized boats go north to fish for shark. Large longliners fish for swordfish, tuna and dolphin.

Market considerations are crucial in deciding what to fish. Traditionally, when January comes the larger longliners go shark fishing until the season would close and then try to fish for tuna or swordfish. They use many of these fish to service the restaurants in the local area with a fresh

product and they are able to market it better because they pack it fish themselves rather than buying it. Because of this market they would stay fishing for swordfish and mainly tuna until the fall. If the shark season were open at that time, they would want to shark fish September and October. The season, however, is in January and July. Shark trip limits have also made shark fishing less economical for larger boats. Many steam north to fish shark off New York.

The combination of this shifting multispecies fishery and management leads to a complaint voiced by nearly every Wanchese fisher and fish dealer. Wanchese fishers are used to jumping from species to species, but management causes everyone to jumps at the same time. As one respondent put it "this may be good for a specific species at a specific time but it is not good for the whole system." The price of the fish dives when fishers have to shift their effort all to the same species. Some marginal fishers get driven out when these shifts happen. A respondent associated this observation with the fact that there used to be 7-8 Black fishers, and now there are only two. This effect is especially felt when the fishing is good. Another respondent, a fish dealer, said "We had a tremendous amount of fish this winter, one of the busiest winters in a long time. The price of fish was cheaper all winter because everyone was fishing on the same thing. [My] personal trawlers scalloped and floundered. When floundering closed, we had to flynet, fishing for the same fish as gill netters in small boats. We caught a lot, but got nothing for it. I have 350,000 lbs of croakers left, that were caught in March, frozen."

The multispecies nature of the fishery led one respondent to suggest that the loss of the shark quota did not have a major impact in Wanchese because of the number of alternatives. The switch from longlines to gillnets takes a substantial investment at first, but it is then just a day or two to change the gear. Others disagreed, arguing that this initial investment is a hefty one if you are going to do it right. A net reel costs $3000 and will last three or four years. Nets often need to be replaced every year. One gillnet captain spent $6000 on nets last year. A longline tackle supplier explained that shifting between longline gear can also be expensive. Tuna longline gear can be shifted to shark longline gear fairly cheaply, they need different hooks, leads and buoys. This is not true the other way round because shark fishing tends to damage the mainline.

The major fish houses tend to specialize, one of them in hook fisheries. This house reports that shark (including dogfish) is now 40 percent where it was 25 percent in the recent past. Tuna is now 40 percent where it was 50 percent. Swordfish is now 10 percent where it was 15 percent. The remainders are bluefin tuna and dolphin. This house packs between seventy and one hundred different boats through the course of a year. They pack about thirty-five or forty on a full time basis when they are in this area. They develop an ongoing relationship with these boats. When they are in this area, they will come to that dock and their fish is unloaded even if it is not the species that the house does most of its business in. They also provide dockage fee of charge.

The fish house owner reported that he is paying between $3.25 and $4.25 for a pound of swordfish that this time of year should be getting $6.00. He attributes the main cause of dropping prices to an increase in imports. The dollar is strong, and the domestic market is the key one for swordfish. The European market is growing but the Japanese eat very little swordfish. Swordfish is caught in Brazil, Argentina, and Africa. The owner says "Just in the last month there has been hundreds of pounds of fish being produced in Africa. We are on a limit, the season was closed

the first of April. You would think that the supply of fish would be way down, therefore the price would be way up, but the price is $2-3/lb less than it was ten years ago." The houses have tried to make up for lost business and low prices by expanding overseas themselves and bringing the fish to Wanchese. They try to fly and truck the fish in but it has not worked well. The swordfish boycott is also having a strong effect because the restaurants and retail markets that are complying with the boycott are the upper end market. High quality is the American fleet's key market advantage over the imports.

The closeness of the kinship and other historical networks in the community allows for flexible cooperation that matches the flexibility of the fishery. For example, one fish house provides freight for all the houses on a flexible, contingency basis. Another house has two tractor trailers and if that house has less than 10,000 lbs one day they take their freight on the first house's trucks. Another uses this service when he has under 5,000 lbs, because he has one small truck. The house that provides the freight service used to have seven trucks, however, now they have four.

Issues of Crew and Ownership

Hiring and managing crew is getting increasingly difficult. This is especially true for the larger boats that need people who can stay out longer. There is a lot of turnover in fishing crews, particularly when boats have to shift fisheries and the revenue drops. It used to be that job alternatives, carpentry and building for the tourist industry are common examples, did not pay as well as fishing. This is often no longer the case. Including the captain, gillnet boats take two or three people, smaller longliners take three people, the larger longliners try to have four but sometimes fish with three. Many respondents reported seeing a trend where those people who are available for this work were transients or people who cannot find employment elsewhere. There have been problems with alcohol, drugs dependability and crew creating trouble in the general community. Several respondents reported that they had or knew of boats that were not fishing specifically because they could not find crew to hire.

Wanchese is a conservative, rural community where major fishing business decisions have hinged on interpretations of how the Sabbath should best be honored. Some boat owners are very disturbed at the prospect of dealing with drunkenness, drugs and theft in crew. This goes beyond simply management headaches, people in Wanchese want, as they have in the past, to give jobs to people who are going to contribute to stable community that reflects their values. One boat owner said "this is what makes me want to quit. I can handle dealing with regulations, I can’t deal with the crew. You have to deal with people you wouldn’t want to associate with. The good people are just giving it up and trying to find shore jobs." Successful fishers from prominent fishing families are discouraging their children from going into fishing.

Many captains and boat owners are searching for alternatives. Fishing is an industry that allows people to make a good living based on skills and knowledge that do not come from formal education. As one respondent put it, "a guy who’s making $1000 a week fishing with no education is not going to get a job on land for $1000 a week." Selling boats is difficult. There are few buyers. Searching for buyers and listing the boat for sale makes it even more difficult to find

and keep crew. People are leaving fishing for carpentry and building for the tourist industry. Many go into running charter boats.

Bluefin tuna management has also had an impact. It is very difficult for a Wanchese fisher to legally land and sell bluefin tuna because of the ratios that attach to the incidental permit. This has led to widespread discards (see also the Panama City profile). "There's more put back dead than are brought to the dock - that's a crime against nature" a fish dealer said.

FISHERIES MANAGEMENT ISSUES

Other Comments Offered by Respondents

On the shark rebuilding schedule, one shark fisher commented that he would like to see ITQS or some other form of limited entry place on the shark industry before there is any future increase in the quota. Otherwise he fears a doubling of the fleet to match any doubling of the quota. If limited entry were in place then he could see a benefit of stopping all fishing for two years to rebuild the stock quickly.

Another fisher was very concerned about the effect of management politics, particularly the increased tension between the commercial and recreational communities, on the community and the people in it. "It's getting worse because of the propaganda... I've never wanted to admit it until now, I won't be fishing in a couple years. One, if you really care about what you are doing, it consumes you. Even though you have groups and organizations, everybody don't represent everybody's interests. You can't be at every meeting. When you look at the schedules of the meetings, you've got to do one or the other. This is a community and it is dividing us and it will get worse. "

CHAPTER 6 - LOUISIANA

STATE PROFILE

Demographic and Economic Characteristics

The population of Louisiana according to the 1990 Census is 4,219,973 residents. The educational attainment in Louisiana is such that approximately 68% of the population 25 years and older are high school graduates. The unemployment rate is 9.6% of the civilian labor force. Industries that are important sources of employment include *retail* (employing 17% of the working residents), *health services* (9%), and *educational services* (10%); *agriculture, forestry and fisheries* industries account for nearly 3% of the employed residents. The per capita income for Louisiana for 1989 was $10,635.

Fisheries Characteristics

Bluefin Tuna In 1996, landings of bluefin tuna in Louisiana totaled 40,922 pounds; these landings accounted for approximately 2% of the total bluefin tuna landings in the Atlantic and Gulf states in 1996. These Louisiana landings were valued at $174,118 which represents approximately 1% of the total economic value of bluefin tuna landings in the Atlantic and Gulf states (NMFS).

Swordfish The 1996 landings of swordfish in Louisiana totaled 769,934 pounds; these landings accounted for nearly 16% of the total swordfish landings in the Atlantic and Gulf states in 1996. The value of these landings was $1,916,479 which represents approximately 12% of the total economic value of swordfish landings in the Atlantic and Gulf states for 1996 (NMFS).

Large Coastal Sharks The Louisiana landings of large coastal sharks in 1996 totaled 1,373,625 pounds. These landings had a dollar value of $1,927,937 (NMFS).

Recreational Fishery In 1996, there were 346 saltwater anglers in Louisiana; these anglers account for approximately 4% of the total number of saltwater anglers in the United States that year. Seventy-four percent of those anglers were residents of Louisiana and 26% were nonresidents. There were 2,083 days of saltwater fishing in Louisiana in 1996; these days accounted for 2% of the total days of saltwater fishing in the United States that year. Eighty-nine percent of those days were by residents of Louisiana and 11% were by nonresidents (FWS, 1997).

In 1996, expenditures by saltwater anglers in Louisiana totaled $205,418,422; this accounted for nearly 2.5% of the total U.S. expenditures by saltwater anglers that year. Saltwater fishing in Louisiana had an economic output of $395,016,185 (1.6% of the U.S. total), generated wages and salaries of $104,723,270 (1.6%) and created 5,627 jobs (2.0%) (ASA, 1997).

MAJOR LOUISIANA HMS AND BILLFISH COMMUNITIES

Demographic Characteristic

The communities in Louisiana likely to be affected by Fishery Management Plans are found in Table 6.1. With the exception of New Orleans and Houma, all of the communities have

populations below 6,000 residents. New Orleans and Houma also have the lowest male to female gender ratios; only Venice has a gender ratio that suggests more male residents than female. Age composition relative to the 15 to 44 year old age group is similar among the Louisiana port communities; the range is between 44% of the population in Grand Isle to 48% in Larose. With the exception of New Orleans, the household compositions of these communities consist of more than 50% married family households. School enrollment is highest in Dulac (30% of the population over 3), New Orleans (31%) and Venice (31%); at 19%, Grand Isle is the only community to have a school enrollment below 25%.

Demographic data for two communities in Louisiana was not readily available - Leeville and Port Fourchon. Both are located in LaFourche Parish.

Economic Characteristics
Unemployment rates are strikingly high in Dulac, at 17.5% of the civilian labor force, and New Orleans, at 12.7%. Not one of the Louisiana communities has an unemployment rate below 6.0%. New Orleans, by far the largest and most urban of these communities, has the only income per capita over $10,000. Dulac and Venice have the lowest incomes per capita, $4,946 and $6,949, respectively.

While incomes per capita are relatively low, employment in the *agricultural, forestry and fishing* industry is most prominent in Dulac and Venice; Dulac has one of the highest unemployment rates among these communities. Cameron also has a sizable percentage of its workers employed in these industries. In New Orleans, less than 1% of the working population is employed in these industries.

Fisheries Characteristics
Table 6.2 gives 1996 landings and permit information for the communities in Louisiana likely to be affected by Fishery Management Plans.

Bluefin Tuna In 1996, Dulac had the largest landings of bluefin tuna with 20,773 pounds (dry weight). Venice and Leeville also had considerable bluefin tuna landings with 9,691 and 3,757 pounds, respectively.

Swordfish New Orleans had the largest landings of swordfish in 1996; other communities with swordfish landings were Cut Off, Larose, Dulac, Houma, Leeville, and Venice.

Large Coastal Sharks Only two communities on Table 6.2 have landings of large coastal sharks for 1996 - New Orleans and Dulac.

TABLE 6.1
LOUISIANA COMMUNITIES AFFECTED BY FISHERY MANAGEMENT PLANS
DEMOGRAPHIC CHARACTERISTICS
Source: U.S. Bureau of the Census

Community	1990 Census Population	Sex Ratio M/F	% Married Family Households	% of High School Graduates Age 25 and over	Civil Unemployment Rate	1989 Per Capita Income	% Agriculture, Forestry & Fisheries Industry
Cameron	2,041	0.97	65.4	46.6	9.6	$8,654	11.0
Cut Off	5,325	0.95	76.2	54.6	6.9	$8,548	5.0
Larose	5,772	0.99	67.7	53.8	7.7	$8,251	4.9
Dulac	3,273	0.97	68.3	27.1	17.5	$4,946	19.6
Houma	30,495	0.90	53.8	62.6	8.4	$9,790	1.5
Grand Isle	1,455	0.96	59.1	57.0	7.4	$9,571	5.4
Leeville*							
New Orleans	496,938	0.87	35.6	68.1	12.7	$11,372	0.8
Port Fourchon*							
Venice	2,743	1.06	72.6	43.5	6.4	$6,949	14.5

TABLE 6.2
LOUISIANA COMMUNITIES AFFECTED BY FISHERY MANAGEMENT PLANS
FISHERIES CHARACTERISTICS
Source: NMFS

Community	Bluefin Tuna Landings *dry wt in lbs*	Bluefin Tuna Landings *rank*	Commercial Tuna Permits *number*	Commercial Tuna Permits *rank*	Recreational Tuna Permits *number*	Recreational Tuna Permits *rank*	Swordfish Landings *# of fish*	Swordfish Landings *rank*	LC Shark Landings *# of fish*	LC Shark Landings *rank*
Cameron	610	4			2					
Cut Off			1				416	3		
Larose							219	4		
Dulac	20,773	1	5	6	1		526	2	483	2
Houma			6	4	18	4	181	5		
Grand Isle			13	3	51	3				
Leeville	3,757	3	6	5	2		61	7		
New Orleans			20	2	66	2	3,735	1	1,696	1
Port Fourchon	386	5	4		6					
Venice	9,691	2	23	1	204	1	54	8		

DULAC COMMUNITY PROFILE

While local residents of Dulac have long harvested marine resources for both income and nutrition, we found no evidence that local residents extracted the highly migratory species in question for this study. With the exception of Mexican migrant workers, one dock owner and several employees, those involved in the commercial tuna, swordfish and shark industry live elsewhere.

Dulac lies in the center of Terrebonne Parish, about 15 miles south of Houma, the parish seat. Terrebonne Parish government is a consolidated government so most data is gathered on a parish-wide basis. According to the Terrebonne Parish Planning Department, the parish has not spent much time tracking the importance of the commercial fishing industry, but anecdotally, one planner knows that it is a long-standing staple of the community economy. “Commercial fishing isn’t going anywhere,” she said. “We’ll always be on the water.... The harvest has been lower, but we have the trained fishermen. We have, of course, the access." However, in her anecdotal knowledge of the commercial fishing industry in Terrebonne Parish, highly migratory species of tuna, swordfish and shark did not emerge as part of that picture. “I’ve never heard of that down here,” she said. Yet, landings of tuna, swordfish and shark indicate that Dulac is among the most important ports in the state and even along the Gulf of Mexico coast for those species.

Of the three docks that purchase fish from long line vessels, two are owned and operated by first-generation Vietnamese immigrants. One dock owner estimates that only 40 percent of his business comes from long line purchases, and the other owner buys only pelagic long line fish. The third dock is run by a white New Orleans native whose father operates a large tuna wholesale company in Venice. Of the three docks in Dulac, the one run by the “American” purchases the most tuna, swordfish and shark from the largest number of boats.

DEMOGRAPHIC PROFILE

Population

Because Terrebonne Parish is a consolidated government, meaning there is just one central government without small municipal governments. Most of the statistical data on the area is collected at the parish, not municipal level. The most recent demographic information available for Dulac comes from the 1990 Census, which records information for the area as a “census data place” (cdp). The 1990 population of Dulac was 3,273.

Racial and Ethnic Composition

Racially, about half the population is described as white and just under half was listed as American Indian, Eskimo, or Aleut. This category described the Houma Indians, a tribe not recognized by the U.S. government. The racial categories Black and Hispanic made up about 2% of the population each. Even fewer were the Asian and Pacific islander category, despite the fact that most of the longline captains who sustain the Dulac commercial industry for tuna, swordfish and shark are Vietnamese. Two of the three docks that purchase the species of interest are owned by Vietnamese immigrants who live in Houma. The white dock owner moved his family from New Orleans to Dulac in the mid-1990s. Of the 3,321 people who reported their ancestry in the

1990 Census, 1,746 claimed French or French Canadian ancestry, and 1,345 claimed “other," which is likely the Houma Indians and possibly some other unidentified population. According to the 1990 U.S. Census, there are no Vietnamese living in Dulac. All three dock owners started their businesses in Dulac in the last 10 years.

Age Structure

More than half the population is 18 to 64 years old. About 10% of the population is less than five years old. Children ages 5 to 17 comprise 27% of the population and people 65 and older make up 7 percent. Females slightly outnumber males. There are 98 males per 100 females.

Household Composition

In 1990 there were 910 households with an average of 3.59 people living in each. Just over 11% of the population lived in one-person households. Twenty-three percent of the households in Dulac (including owner-occupied housing and renters) spent 35% or more of their household income on shelter costs, either rent or a combination of mortgage and specific housing-related costs. Tables 6.3 and 6.4 supply additional household information.

TABLE 6.3
HOUSEHOLD COMPOSITION
DULAC, LA
Source: U.S. Bureau of the Census

Total Number of Households	922
Average Number of Persons per Household	3.59
Percent of Married-couple Family Households	68.3
Percent with own children under 18	40.1
Percent of Male Householder Family Households	4.7
Percent with own children under 18	1.6
Percent of Female Householder Family Households	12.8
Percent with own children under 18	8.7
Percent of Non-family Households	14.2
Percent of Householders Sixty-five or older	14.5

TABLE 6.4 HOUSING INFORMATION DULAC, LA Source: U.S. Bureau of the Census	
Total Housing Units	1,182
Owner-occupied Units	729
Median Value	$28,700
Renter-occupied Units	181
Median Contract Rent	$317

Educational Trends

As of the 1990 Census, only 27% of Dulac residents 25 years and older had completed high school. Half of the population over 25 years old did not complete the 9th grade. Nearly 2% of the population earned a bachelor's degree or higher. Additional information on educational attainment is found in Table 6.5.

TABLE 6.5
EDUCATIONAL ATTAINMENT
(PERSONS 25 AND OLDER)
DULAC, LA
Source: U.S. Bureau of the Census

	# of Persons	% of Population 25 years and older
Less than 9th grade	952	55.5
9th to 12th grade, no diploma	298	17.4
High school graduate (includes equivalency)	318	18.6
Some college, no degree	93	5.4
Associate degree	20	1.2
Bachelor's degree	19	1.1
Graduate or professional degree	14	0.8

The educational opportunities for Dulac residents are limited. There are no schools in Dulac itself, but children attend school from pre-kindergarten through grade 12 at schools in a neighboring town. The Dulac Community Center offers tutoring. There are no community colleges or higher education facilities in the area.

Economic Characteristics

Income and Poverty The 1989 per capita income for Dulac according to the 1990 Census is $4,946; this is lower than the per capita income of Venice ($6,949) and considerably lower than the per capita income of Louisiana ($10,635).

Nearly half of the Dulac population was living in poverty at the time of the 1990 Census. The median household income in 1989 was $12,653, and 44.5% of the families in town lived below the poverty level.

Of the 922 Dulac households where income was recorded, wage earners were present in only 66 percent (613) of them. Their mean wage and salary income was $16,423. Non-farm self-employment income averaged $9,473 for 209 households (23%). Thirty percent of the households (277) received Social Security income that averaged $7,254 annually, and more than 20% (192) received public assistance that averaged less than $3,000.

Employment Unemployment was high in Dulac according to the 1990 Census, but now, according to the Terrebonne Parish Planning Department, unemployment parish wide has plummeted to less than 3%. A recent surge in the oil industry has created a labor shortage and well-paid oil field workers. However, one planner estimates the boom is approaching a crest, and oil prices have dropped so low that it is difficult for companies to maintain their profit. She predicts that employment and wages will plateau and perhaps decline soon.

Houma lies at the intersection of the Houma Navigational Canal and the Intercoastal Waterway and serves as the parish seat and a locale of employment opportunities in offshore equipment building for Dulac residents.

Of the 2,185 residents in Dulac who are 16 years old or older, only 46% of them, or 1002, are considered to be in the work force, according to the 1990 Census. Of those counted as among the labor force, 17.5% of them were unemployed. Only 827 people, or nearly 83%, of the population 16 years and older, were employed. The occupation category *farming, forestry and fishing* was the largest with 142 participants and 17% of the working population. Between 12% and 13% of the population worked in the following categories: *handlers, equipment cleaners, helpers, laborers, service (not protection and household), precision production, craft and repair, and transportation and material moving*.

Employment by Industry The two major industries that offer job opportunities to Dulac residents are oil and seafood. The largest industry category that employed Dulac residents in 1990 was *agriculture, forestry and fisheries* with 162 people, or nearly 20% of the employed population. In Dulac, fishing is the only represented industry in that category. *Retail* jobs employ nearly 18% of the population, and *manufacturing of non-durable goods* employs nearly 11%. Table 6.6 supplies additional information on industry and employment from the 1990 Census.

TABLE 6.6
EMPLOYMENT BY INDUSTRY
(EMPLOYED PERSONS 16 YEARS AND OVER)
DULAC, LA
Source: U.S. Bureau of the Census

Sector	# Employed	% Employed
Agriculture, forestry, and fisheries	**162**	**19.6**
Mining	33	4.0
Construction	31	3.7
Manufacturing, nondurable goods	89	10.8
Manufacturing, durable goods	27	3.3
Transportation	73	8.8
Communications and other public utilities	0	0
Wholesale trade	70	8.5
Retail trade	146	17.7
Finance, insurance, and real estate	0	0
Business and repair services	45	5.4
Personal services	27	3.3
Entertainment and recreation services	0	0
Professional and related services	108	13.0
Public administration	16	1.9
Total	827	100

FISHERIES PROFILE

Commercial Fisheries

As stated earlier, 17 percent of the resident population in Dulac work in *farming, forestry and fishing* according to the 1990 Census. It is likely that fishing is the only category represented in the area. However, the docks and fishers who target the highly migratory species of interest in this report are largely a commuter population. They land fish in Dulac or purchase fish in Dulac, but they live elsewhere.

Employees/Plant operation One Vietnamese-owned dock employed 3-4 people, but laid them all off this year. The owner unloads the boats and his wife tallies the catch. His business is comprised of 50 percent tuna purchases, 20 percent swordfish, dolphin, wahoo, and amber jack, and 30 percent shark.

The white-dock owner employs 6 or 7 people in Dulac, including a tuna grader who he sends to the Vietnamese dock in the adjacent lot. All of the white-dock owner's employees live in Dulac. He buys all of the catch at the Vietnamese dock next door. Of his total purchases, 60 percent are tuna, 20 percent are swordfish and 20 percent are divided among other pelagic species like shark, wahoo, amber jack. His employees pack and ship boxes of whole fish carcasses throughout the country via New Orleans International Airport.

One of the Vietnamese docks in Dulac employs 6 Mexican migrant laborers who live in trailers behind the dock. The employer is a first-generation Vietnamese immigrant and claims that local employees failed to return to work for several days or weeks after receiving their pay checks. He does not have this problem with the immigrant workers, who live there year round and replace themselves with friends or relatives who want to work in the U.S. when they are ready to go home. To supplement this regular staff, the owner sometimes hires local residents.

Fishery Issues/Characteristics Fishermen target yellowfin tuna all year. There is no established quota or season for yellowfin, but during the winter rough weather shortens the fishing season slightly. Yellowfin sells for $3.50 to $5 a pound for grade 1. Bluefin tuna is a by-catch of yellowfin longlining. Small blacktip shark is the main catch in the shark fishery. Shark dressed weight goes for between 30 and 50 cents a pound. Shark fishermen don't fish much during the winter because the boats tend to be smaller. Shark are caught at five to 20 miles from shore, and tuna are caught 100-300 miles out. Tuna fishermen generally cut the line when they hook a shark. Swordfish is not targeted by Dulac longliners. A typical trip is two weeks. Boats range in size from 60 to 100 feet and set between 35 and 40 miles of longline rigging. Most fish for live bait for two or three days at the start of a trip. They prefer live bait as they target yellowfin tuna, instead of using frozen squid or light sticks which they would use if they wanted to target swordfish.

Dock owners spoke of buying from more shrimp boats in the past, but said by the mid-1990s those boats had relocated to Hawaii and California where the shrimp catch was better. They also said because of Bluefin tuna regulations in 1987-1988, "a bunch of people went out of business."

Main concerns of the fishers are an abundance of complicated regulations. They do not like regulations that reduce their flexibility in where and when they can seek fish. Price fluctuations are also a concern. Shark long line fishermen say shifting the start of the year to June 1 would help smaller boats that can't fish in the Gulf during the winter. Fishermen and dock owners called the 3 million pound Louisiana quota for shark this year "devastating."

Respondents expressed concern that movement from the shark fishery to the yellow fin tuna fishery will repeat what happened to them with red snapper. In the mid-1980s snapper was overfished, and NMFS suggested they fish for shark. Many fishers did. A limited entry management program began for snapper and the eligibility criteria depended on landings after 1985. Many of the fishers who went over to shark now cannot get back in the red snapper fishery. Most of these fishers were non-Vietnamese. Hence, there is some fear that fishing for YFT will lead to being shut out of the shark fishery in the future.

Almost all boats that sell in Dulac are owner operated. Owners are usually their own captains or they hire a close relative to captain their boat. Although owners will hire captains if they have more than one boat, there are only a few cases of this. It is difficult to get captains. Good first mates try to get their own boats. A respondent working in a fish house says that he knows of five boats that were built last year and added to the fleet. These boats are restricted to only a 5 percent upgrade, however, which makes it impossible for shark fishers to switch into the YFT fishery, which requires a much larger vessel.

Shark Regulations Federal and state regulations for catching shark are contradictory and confusing. Shark fishermen must have both state and federal licenses to fish for shark in federal waters. The state license is needed to transport shark through state waters to a dock for sale. If a shark boat has both a federal and state license, it cannot fish in state waters when the federal season is closed. Local native fishers do not long line for shark. They use nets and add to these permit requirements, a transversal permit to bring their state-banned gillnet through state waters. Local net shark fishing occurs mostly inshore during the spring when sharks are laying their pups. Closing during that season would eliminate the industry.

Docks A main concern of dock owners is to have a consistent supply of whatever fish they are buying. This consistency is important in marketing species for sale.

Often docks will provide credit and support to fishers who sell to them. Sometimes fishermen pay back their loans. Sometimes they don't.

At one point in the early 1990s, a Dulac fish house was selling 50,000 lbs of fillet shark a week to supermarket chains. Now they sell much less because the markets do not like the up and down supply that results from the bi-annual closures. Before these closures, the owner reports, the average price of shark was .50 lb, now it is .30 because the supply is not regular. Another Dulac dealer maintained he could not sell 30,000 lbs of frozen shark he had at the time he was interviewed. They say that they can live with the 4000 lb. trip limit, given the size boats they fish and the distances they go, but they need to fish year round. A consistent supply would help them recapture sales to supermarkets.

Markets are not the only problem with fluctuations in the catch for these longline fishermen. Employment opportunities during the rest of the year are limited. One shark boat captain said that he harvest oranges locally when he cannot fish. That labor only draws about four dollars an hour in wages.

It has become very difficult to get loans because the fishery is not making any money. If engines go down they say that they cannot get a loan even from the fish houses. The Dulac fish houses traditionally lend the fishers money to informally tie them to selling fish to the lending house. These are no interest loans, but they are now rarely made to the shark boats. These loans traditionally reflected networks of trust that led boats to deal with the same fish house for years.

VENICE COMMUNITY PROFILE

While local residents of Venice have long harvested marine resources for both income and nutrition, we found no evidence that Venice residents extract the highly migratory species in question for this study. With the exception of a few local employees and seasonal housing for a couple of dock owners and Mexican migrant workers, those involved in the commercial tuna, swordfish and shark industry live elsewhere. Most pelagic long liners who sustain the commercial tuna industry in Venice are Vietnamese and live in New Orleans or a suburb of the city. Even Louisiana natives who fish for shark with nets in state waters live in neighboring towns, not in Venice.

The major industries that offer job opportunities in Venice are oil, seafood and, increasingly, recreational fishing. “Venice is not much more than a jumping off point for the oil industry,” said the Catholic priest in the area. Geographically, Venice lies at the southern most tip of Louisiana that is accessible by car. It lies about 30 miles south of the parish seat Point a la Hache, at the end of state highway 23 which is flanked for miles by levees that border the Mississippi River and eroding wetlands on either side.

The swamp land of Venice juts further into the Gulf of Mexico than Dulac and closer to billfish areas that recreational fishermen frequent. Recreational fishing increased steadily there in the last seven or eight years, according to the Louisiana State University Sea Grant agent in the area. Commercial and recreational fishers vie for common stocks and blame each other for declines in numbers and size of fish.

Animosity extends to the political arena, as commercial and recreational fishermen oppose each other on regulatory issues. Among local commercial fishers, there is a sense that recreational fishers have helped create a regulatory environment that is pushing commercial fishers out of business. One former commercial fisherman who works for one of the recreational marinas said, “Let the people who put you out of business support you in a way. If you look at it that way, you can survive."

By far, shrimp is the largest commercial catch bought and sold in Venice. However, a couple of docks draw 40 percent of their business from the long line catches, while about 60 percent come from shrimp and bottomfish. Another dock only draws about 20 percent from long line boats. A large wholesaler deals only in long line catches and actually purchases fish from three of the four local docks. He pays a docking fee of 25 cents per pound of unloaded fish. In 1997, 60 percent of his business was tuna, 30 percent shark and 10 percent swordfish.

DEMOGRAPHIC PROFILE

Population

The latest demographic information about Venice comes from the 1990 Census and includes both Venice and Boothville, the adjacent town. The census reports information for the “census data place” (cdp) Boothville-Venice, referred to throughout this report, simply as Venice. The 1990 population of Venice was 2,743. There were more women than men in Venice, with a ratio of 104.7 to 100.

Racial and Ethnic Composition
Racially, 66%of the residents were White, and 28% were Black. The categories American Indian, Eskimo or Aleut and Hispanic made up two percent each. Only 18 residents were Vietnamese, despite the fact that most of the longline captains and dock owners who sustain the Venice commercial industry for tuna, swordfish and shark are Vietnamese. Of the 2,669 people who reported their ancestry, 33% said they were French or French Canadian. Nearly 36% fell into the "other" category. All of the four docks that purchase those species in Venice are Vietnamese owned. The wholesale business owner in the area is white.

Age Structure
Nearly 58% of the population was 18 to 64 years old. About 6% of the population was 65 years and older. Nearly 11%was less than five years old and children ages five to 17 comprised 25 percent of the population.

Household Composition
In 1990, there were 844 households with an average of 3.25 people living in each. Just about 15% of the population lived in one-person households. About 17% of the households in Venice (including owner-occupied housing and rental units) spent 35% or more of their income on shelter costs, either rent or a combination of mortgage and specific housing-related costs. Tables 6.7 and 6.8 show additional household information.

TABLE 6.7
HOUSEHOLD COMPOSITION
VENICE, LA
Source: U.S. Bureau of the Census

Total Number of Households	836
Average Number of Persons per Household	3.25
Percent of Married-couple Family Households	72.6
Percent with own children under 18	45.3
Percent of Male Householder Family Households	2.6
Percent with own children under 18	1.7
Percent of Female Householder Family Households	9.4
Percent with own children under 18	6.6
Percent of Non-family Households	15.3
Percent of Householders Sixty-five or older	13.5

TABLE 6.8 HOUSING INFORMATION VENICE, LA Source: U.S. Bureau of the Census	
Total Housing Units	974
Owner-occupied Units	699
Median Value	$47,900
Renter-occupied Units	145
Median Contract Rent	$337

Educational Trends

As of the 1990 Census, only 43.5% of Venice residents 25 years and older had completed high school. Nearly 30% of the population over 25 years old did not complete the ninth grade. Nearly 4% of the population earned a bachelor's degree or higher. Table 6.9 shows the data for educational attainment in Venice.

TABLE 6.9
EDUCATIONAL ATTAINMENT
(PERSONS 25 AND OLDER)
VENICE, LA
Source: U.S. Bureau of the Census

	# of Persons	% of Population 25 years and older
Less than 9th grade	411	28.0
9th to 12th grade, no diploma	418	28.5
High school graduate (includes equivalency)	453	30.9
Some college, no degree	123	8.4
Associate degree	7	0.4
Bachelor's degree	37	2.5
Graduate or professional degree	19	1.3

The educational opportunities for Venice residents are limited. Boothville Venice High School serves students in kindergarten through 12th grade. There are no other educational facilities in Venice. The Plaquemines Parish School system buses high school students who want to take honors or college-preparatory courses to the public school in Buras, about 15 miles north. There is a Catholic school, a vocational technical school and a business program for high school students in towns within 30 miles north of Venice.

Economic Characteristics

Income and Poverty The 1989 per capita income for Venice according to the 1990 Census is $6,949; this is higher than the per capita income of Dulac ($4,946) but still considerably lower than the per capita income of Louisiana ($10,635).

Venice residents living below the poverty level comprised 36 percent of the population, according to the 1990 Census. About 32% of the families in Venice lived in poverty. The median household income was $16,250. Per capital income averaged $6,949.

Of the 836 households in Venice where income was reported in 1989, wage earners were present in 68% (569) of them. Their mean wage and salary income was $25,827, significantly higher than those of Dulac residents. Non-farm self-employment income averaged $10,911 for 138 households (16.5 %). Eighteen percent of the households received Social Security, averaging $5,433 a year, and 11% of the households received public assistance income, averaging $3,301 a year.

Employment Although only half the Venice population age 16 and older was considered to be in the labor force. Of the 1,794 people 16 and older, only 922 (51%) of them were in the labor force. Of those, 863 were employed, and only 59 (6.4%) were unemployed. Compared to Dulac in 1990, this unemployment rate is extremely low, perhaps because Venice has been the epicenter of oil industry activity in Louisiana, or perhaps because local commercial fishing has served residents well during fluctuations in the oil industry.

About 17% of the employed residents worked in *precision production craft and repair occupations.* Occupations in the category *transportation and material moving* employed 14%, and *farming fishing and forestry* employed 12%. The area is known for its citrus fruit, especially satsumas and navel oranges. Local citrus groves probably employ some residents, and further inquiry into wages and job security is needed.

Employment by Industry The major industries that offer job opportunities in Venice are oil, seafood and, increasingly, recreational fishing. There are at least 70 oil-related businesses in Venice and Boothville, most located past the levee in clusters of commercial enterprises down roads with names reflective of the local priest's observation -- "McDermott Road," "Chevron Road" "Offshore Shipyard Road" and "Jump Basin Road."

Table 6.10 shows the major industries in Venice by employment. *Retail* was the largest industry category that employed Venice residents in 1990 with 16%, or 138 of the employed residents falling into that category. *Agriculture, forestry, fisheries* and *transportation* employed 14.5%, or 125 of the employed residents.

Increasingly, recreational fishing is growing into an industry that offers service-sector jobs to Venice residents and residents of neighboring towns.

TABLE 6.10
EMPLOYMENT BY INDUSTRY
(EMPLOYED PERSONS 16 YEARS AND OVER)
VENICE, LA
Source: U.S. Bureau of the Census

Sector	# Employed	% Employed
Agriculture, forestry, and fisheries	**125**	**14.5**
Mining	69	8.0
Construction	93	10.8
Manufacturing, nondurable goods	34	3.9
Manufacturing, durable goods	27	3.1
Transportation	126	14.6
Communications and other public utilities	8	0.9
Wholesale trade	81	9.4
Retail trade	138	16.0
Finance, insurance, and real estate	6	0.7
Business and repair services	38	4.4
Personal services	26	3.0
Entertainment and recreation services	0	0
Professional and related services	77	8.9
Public administration	15	1.8
Total	863	100

FISHERIES PROFILE

Commercial Fisheries

There are four docks in Venice where longline boats unload. One wholesaler purchases catches at three of these docks for a 25 cent docking fee. The fourth dock sells to a different New Orleans-based wholesaler. Like Dulac, the docks and fishers who target the highly migratory species of interest in this report are largely a commuter population. They land fish in Venice or purchase fish in Venice, but live elsewhere. Owners of two docks live at their docks during busy seasons, but this housing is considered transitory. One 33-year-old woman dislikes living in Venice and considers her home Houston Texas where her two daughters live during the school year. During the summer, the girls move to Louisiana and live with their aunt in a New Orleans suburb.

While tuna fishermen with large vessels work year round, pelagic longlining in the area tends to slacken during the wintertime. It is heaviest in May. The docks purchase tuna year round, shrimp

from May through December, bottomfish such as drum, catfish and sheepshead, from January through May, mullet (for the roe) from October to December.

Resident commercial fishers used nets to fish shark mostly in state waters. They say confusing and contradictory regulations have made shark fishing less worthwhile. One local fisherman who quit using nets to catch shark in 1992 said a local dock owner purchased his first shark license for him in the late 1980s because National Marine Fisheries Service urged the development of shark fishing in the area.

Annually, these inshore net fishers would target shark from April to October. They would fish a four to five day trip using a 1200 foot gillnet with an 8-inch mesh and a crew of three to four people working on a 60-foot boat. When they weren't fishing shark, they would target pompano in October, mullet October to January, shrimp May to December and Oysters January to May.

Employees/Plant Operation Docks in Venice seasonally employed between five and 15 Mexican migrant laborers for unloading boats and packing seafood. Docks employed between five and 8 people year round. Owners often entrust office work to family members, but two docks each employed one local woman to work in the business office. One of the women is the wife of a local commercial fisherman, and the other is married to a local man who works in the oil industry. Neither live in Venice. The wholesaler had 15 local employees, some actually residents of Venice, others who lived in the surrounding area. He employed more than 100 people just a couple of years ago when he also owned a dock and processing plant, which was located in New Orleans.

At one Vietnamese-owned dock, the wholesaler purchases long line catches directly at the dock where boats unload. He pays a docking fee of 25 cents per pound of fish unloaded. This dock sells ice and fuel to longline fishers and reaps a significant docking fee. One of the partners estimates that 40 percent of the dock's business earnings come from the tuna industry, despite the fact that the dock does not directly buy or sell tuna.

Fishery Issues/Characteristics Venice was a small community but an important finfish port in Louisiana until the 1995 state gillnet ban. There was an influx of Vietnamese shrimpers who tended not to live in the area and some Vietnamese who purchased existing docks or established new ones in the last 10 years. Locals say some longline boats from Florida and New Jersey fished for swordfish and bluefin tuna in the late 1980s and early 1990s. By the late 1980s shrimp had become a less lucrative fishery. At the same time the domestic fresh fish market developed and prices for yellowfin tuna rose. According to a local Sea Grant agent, Vietnamese and American fishers re-rigged their boats from shrimping to longlining for tuna. The estimated cost to re-rig a boat was $1,000 per mile of line, and most outfitted their boats with 20 to 40 miles of line, he said. The oil industry was also in decline and locals saw some oil boats rig up for long lining. After a boom and bust cycle, prices plummeted from $6 to $7 per pound for grade one yellowfin tuna to $3 to $2.50 per pound for grade one yellowfin. Some boats went back to shrimping, some Vietnamese longliners left for the west coast and others remained. There are virtually no American boats longlining in the area. According to the Sea Grant agent, the industry has reached an equilibrium in terms of boats and in terms of yellowfin tuna price, which

fluctuates but is generally $4 to $5 for grade one. Boat captains complained in June of an unexpected dip in yellowfin prices to $3.50 per pound for grade one.

Among commercial fisheries participants, white and Vietnamese participants perceive disparate enforcement of regulations. It was the Buras Auditorium, just north of Venice, where wildlife agents locked doors and arrested Vietnamese fishermen who were attending their first Delta Commercial Fisheries meeting, according to the former association president who invited the Vietnamese fishers. "We never had one (Vietnamese fisher) come back," he said. "They made it look like the fishermen were criminals." This same white commercial industry participant claims that his business is investigated and regulated more strictly than commercial fishing businesses owned by Vietnamese.

Shark Regulations Regulations on federal and state regulations for catching shark are contradictory and confusing. Shark fishermen must have both state and federal licenses to fish for shark in federal waters. The state license is needed to transport shark through state waters to a dock for sale. If a shark boat has both a federal and state license, it cannot fish in state waters when the federal season is closed. Local native fishers do not long line for shark. They use nets and add to these permit requirements, a transversal permit to bring their state-banned gillnet through state waters. Local net shark fishing occurs mostly inshore during the spring when sharks are laying their pups. Closing during that season would eliminate the industry.

A main concern of local net fishers about regulations that protect species stocks was that recreational fishers be limited as much as commercial fishers.

Recreational Fishing Industry/Seasonal Patterns

Recreational fishers launch from Venice year round, but are affected by winter weather. The larger boats can fish yellowfin tuna year round, in addition to inshore species like redfish, snapper and speckled trout. Bluefin tuna is too far away (100 miles offshore) for them to chase. They fish for billfish, particularly blue marlin from May to October or November. Blacktip shark was once a popular catch, but recreational fishers say because there is now a commercial market for the fish, they are too small to be an enjoyable catch. There is some animosity between recreational and commercial fishers which seems born of competition for particular species.

There are only two marinas in Venice that cater to recreational fishermen, although a third parish-run marina offers boat slips and little else to both recreational and commercial fishers. One opened 13 years ago and offers boat slips, launches, a hoist, a couple of condominiums, baitshop, fuel and ice. It employees 13 people during peak summer months, but the jump in job opportunities in the oil industry make it difficult to find good summer help. Most of the marina's business comes from private boats from New Orleans and border states that launch at the marina or rent slips. The owner estimates that only one percent of his business comes from charter boats, although his son captains one.

The other marina opened only a few years ago, offering 120 pre-paid boat slips, a 64-room two story hotel, condominiums, a dry dock storage facility, fuel and ice. It employs 12-15 people in

its newly opened hotel and another 15-25 in the marina. Eight charter boats operate from the marina, but the owner said he would like to house 10 more.

Industry participants say the catch and release ethic for billfish is strong in Venice among recreational fishers, but billfishing tournaments in the area require that trophy fish be brought to the dock and weighed. Sportfishers prefer to catch and keep tuna, dolphin and wahoo for the meat. One marina owner suggested establishing a certificate program as an "ego boost" for sport fishers. The program would send certificates to sports fishers whose tagged-and-released billfish was recaptured and tagged again. It would indicate to the fisher that "your" fish has survived to be caught again, he said. One charter boat captain makes his passengers sign a contract that they will release any billfish they catch. He said he has lost money from clients who did not "tip" him because he would not allow the client to keep the fish.

As mentioned earlier, some local commercial fishers have become dependent on the growing recreational industry. One commercial fisherman who works informally for the new marina in Venice comes from a family of commercial crabbers. He lives among a small cluster of homes in the Venice swamp accessible only by boat. Four of the homes are occupied year round. The others are summer camps. He refers to the area as "paradise." Commercial shrimping was his mainstay until 1987, and then he tried pelagic long lining for a while. He says it cost him $65,000 to convert his shrimp boat. He left that fishery because he did not like the variability of the grading and pricing. Now he pieces together a living by taking people duck hunting and doing odd jobs for the marina and crabbing.

Regulations Despite complaints from commercial fishery participants that they are harassed by law enforcement agents, the recreational fishers claim fishery regulations are unenforceable in the area. Uniformly, the recreational fishing community said that regulations are not enforced in Venice because there are simply not enough agents to cover the area. "They can make all the rules they want, but they have no efficient means of enforcement," said one recreational industry participant. It is unlikely that recreational fishers will follow new regulations they have no interest in or that they find burdensome.

DULAC AND VENICE VIA NEW ORLEANS

Tuna, swordfish and shark are caught by Louisiana fishermen using long line gear. With the exception of local commercial fishermen who use nets to capture shark during the pupping season inshore, all of the commercial harvest of these species is done with long line gear. Most of these fishermen are first-generation Vietnamese immigrants. Recreational fishing for these species and billfish will be discussed only in the section on Venice. Dulac serves as a launch for no offshore recreational activities probably because it is further inland than other ports.

The largest and most economically significant commercial harvest of seafood landed in the state of Louisiana is shrimp, totaling more than 87 million pounds and nearly $90 million in dock price. However, the 1996 yellowfin tuna harvest of more than 2.5 million pounds brought a dock price of nearly $7.5 million to a fleet of Vietnamese owned long line boats. The Vietnamese longliners tend to live in urban centers such as Houma and the New Orleans metropolitan area,

specifically in the eastern part of New Orleans and on the western bank of the Mississippi River. Captains who dock their boats in Venice or Dulac were interviewed for this work. They tend to own or co-own their boats and work alongside their crew. They drive their crew, often friends and family who live nearby, the 1.5 or 2 hours to boats in Venice or Dulac where they launch for a typically two-week fishing trip.

While some Vietnamese have settled in Dulac and Venice, they do not fish for the species of interest in this report.

History of Vietnamese Settlement

Vietnamese refugees began to settle in the New Orleans area in 1976, with an initial influx of 2,500 people from refugee camps in Guam. Since then there were second and third migrations and re-unification of families. According to the 1990 U.S. Census, 6,412 Vietnamese lived in New Orleans and 4,239 lived in Jefferson Parish. It is likely that a majority of the New Orleans Vietnamese residents lived in an area called New Orleans East, where clusters of Vietnamese restaurants, retail shops and gardens have been established. In Jefferson Parish, Vietnamese tend to live on the West Bank, which refers to the area's position to the Mississippi River. Pastor of Mary Queen of Vietnam Catholic church in New Orleans East estimates that 91 percent of the Vietnamese families in New Orleans East are Catholic and that nine percent are non-Catholic. Between 16,000 and 17,000 people comprise the Vietnamese Catholic parish, which can include any Vietnamese speaking residents of Orleans Parish and the adjacent Jefferson Parish. The population growth of the Vietnamese community has stabilized since 1992.

During the first years of settlement, the pastor helped early settlers find employment in the U.S. He said for the first 15 years of migration, commercial fishing served as the most significant form of income for Vietnamese residents. From 1978 to 1984, people went shrimping with small boats. Eventually, fishermen bought bigger boats and sought other species. He said that Vietnamese residents have shifted to other fields in the last 10 years and that no children are being trained in the industry. Another parish priest who ministers on the Westbank agreed that 20 years ago commercial fishing was more important to the immigrant community than it is now. He said, "Some of our parishioners are fishing, but this is not a fishing community." Vietnamese residents work in factories, casinos and in professional occupations.

All of the fishermen interviewed are between the ages of 35 and 45. Those with children planned to send them to college. In contrast to local native fishers, none of the Vietnamese captains and dock owners wanted their children to fish commercially. Still, it is a career that they hope to continue until retirement. It seems as though commercial long line fishing will be important to the Louisiana Vietnamese community for another two or three decades, but it is not reproducing itself. Commercial fishing, albeit not pelagic long lining, is a more culturally significant economic enterprise for native commercial fishers. Those fishers wanted children to enter the industry, but bemoaned obstacles (particularly regulations) making that difficult.

This is not to say Vietnamese long liners lack "culture." There are Buddhist shrines in dock offices and an annual Catholic blessing of the Vietnamese long line fleet in Venice. Vietnamese fishers' and dock owners' income also helps support family who remained in Vietnam. Still,

without another migration wave, current participants in this industry, who plan to work for another twenty or thirty years, will likely be the first and last generation of Vietnamese long liners in Louisiana.

Refugees and first-generation immigrants who speak halting English and whose education in Vietnam was disrupted by decades of conflict, discovered in commercial fishing an industry in which they could prosper. With the help of friends and family and some bank loans, commercial fishermen purchased 60 to 120 foot vessels. This arrangement of borrowing means that more than one family has money tied up in a vessel and therefore depends on the success of a commercial fishermen. In the past decade, Vietnamese immigrants have opened docks, or purchased them from Louisiana natives in the communities of Dulac and Venice.

Dock owners often provide credit for Vietnamese fishermen who sell to them. One Vietnamese dock owner said Vietnamese fishers and dock owners share past experiences that deepen their business relationship. "We come out of refugee camps. We all the same, so we help each other." For example he and his brother sometimes back Vietnamese fishermen's credit at the fuel dock in Dulac.

Regulations, Enforcement and Organizing

Commercial fishers, particularly native Louisianians, complain that the industry is controlled by "politics not biology." They argue that the various boards charged with regulating the commercial fishing industry are comprised and headed by people with recreational interests. The wife of a local shark fisherman works with the state legislature, attends NMFS and NFI meetings, and works with the organization Save Our Wetlands. She and her husband agree that her political activism increases harassment by agents, meaning agents stop his boat and delay his work much more than necessary. The Vietnamese fishers and their families were not as politically involved.

Louisiana fishers talked about the time and frustration involved in unproductive meetings as a reason for their inactivity. Vietnamese fishers may add fear to those reasons. White and Vietnamese fishers and dock owners mentioned as an example of harassment the following anecdote which was covered by the New Orleans newspaper. During a March 1996 meeting to explain the newly passed gill net law, state wildlife agents arrested 11 fishermen accused of under reporting their speckled trout catch. Ten of those fishermen were Vietnamese (Weiss 1996). In an effort to attract Vietnamese fishers to the local commercial fishing organization, president of the now-defunct Delta Commercial Fisheries urged the Vietnamese fishing community to join the organization and to attend the public meeting. Understandably since the arrests, the Vietnamese fishers did not return to the commercial organization.

Still, white fishermen and industry participants claim that Vietnamese fishermen and docks are immune to laws that apply to local fishers.

All parties said that racism discrimination against Vietnamese fishers has declined. Some white industry people and all Vietnamese said discrimination against the Vietnamese still exists. Some white commercial fishers complain that they cannot compete against what they perceive as

government favored Vietnamese. Others argue that the Vietnamese long liners remained in the industry when native fishermen left it. One white industry participant said that after only a few years of long line fishing, "the Americans got out and the Vietnamese stayed in, learned how to fish and made good money."

CHAPTER 7 - FLORIDA

STATE PROFILE

Demographic and Economic Characteristics

The population of Florida according to the 1990 Census is 12,937,926 residents. Approximately 74% of the residents of Florida are high school graduates. The unemployment rate for Florida is 5.8%. The *retail* trade is the highest employing industry sector in Florida, providing jobs for nearly 20% of the population. Employment in the *agriculture, forestry and fisheries* accounts for approximately 3% of the working population. Per capita income for 1989 was $14,698. Profiles for this state will be divided into East and West Florida.

Fisheries Characteristics

Bluefin Tuna In 1996, landings of bluefin tuna in East Florida totaled 3,973 pounds; these landings accounted for less than 1% of the total bluefin tuna landings in the Atlantic and Gulf states in 1996. These East Florida landings were valued at $12,876 which represents less than 1% of the total economic value of bluefin tuna landings in the Atlantic and Gulf states (NMFS).

In 1996, landings of bluefin tuna in West Florida totaled 538 pounds; these landings accounted for less than 1% of the total bluefin tuna landings in the Atlantic and Gulf states in 1996. These West Florida landings were valued at $1,267 which represents less than 1% of the total economic value of bluefin tuna landings in the Atlantic and Gulf states (NMFS).

Swordfish The 1996 landings of swordfish in East Florida totaled 1,085,251pounds; these landings accounted for 22% of the total swordfish landings in the Atlantic and Gulf states in 1996. The value of these landings was $3,772,028 which represents 24% of the total economic value of swordfish landings in the Atlantic and Gulf states for 1996 (NMFS).

The 1996 landings of swordfish in West Florida totaled 818,095 pounds; these landings accounted for nearly 17% of the total swordfish landings in the Atlantic and Gulf states in 1996. The value of these landings was $2,824,878 which represents 18% of the total economic value of swordfish landings in the Atlantic and Gulf states for 1996 (NMFS).

Large Coastal Sharks The East Florida landings of large coastal sharks in 1996 totaled 2,294,539 pounds. These landings had a dollar value of $2,088,453 (NMFS).

The West Florida landings of large coastal sharks in 1996 totaled 2,466,717 pounds. These landings had a dollar value of $2,508,940 (NMFS).

Recreational Fishery 1996, there were 2,255 saltwater anglers in Florida; these anglers account for approximately 24% of the total number of saltwater anglers in the United States that year. Sixty-four percent of those anglers were residents of Florida and 36% were nonresidents. There were 25,140 days of saltwater fishing in Florida in 1996; these days accounted for 24% of the total days of saltwater fishing in the United States that year. Eight-four percent of those days were by residents of Florida and 36% were by nonresidents (Census, 1996).

In 1996, expenditures by saltwater anglers in Florida totaled $2,213,798,040; this accounted for nearly 26% of the total U.S. expenditures by saltwater anglers that year. Saltwater fishing in Florida had an economic output of $4,106,397,320 (16.3% of the U.S. total), generated wages and salaries of $1,170,943,327 (17.6%) and created 56,278 jobs (19.6%) (ASA, 1996).

EAST FLORIDA MAJOR HMS AND BILLFISH COMMUNITIES

Demographic Characteristics

The communities in East Florida likely to be affected by Fishery Management Plans are found in Table 7.1. These range in population size from over 100,000 residents (Fort Lauderdale, Jacksonville and Miami) to the small Keys community of Islamorada with a population of just over 1,000 residents. The sex ratios of these communities are found to vary from 0.85, in Lighthouse Point, to 1.18, in Islamorada. The percentage of high school graduates 25 and older are highest in Cape Canaveral (83%) and Lighthouse Point (85%); in fact, this percent of high school graduates in Lighthouse Point is much higher than is found in the surrounding communities of Dania (61%), Fort Lauderdale (68%), and Pompano Beach (74%). Percentage of high school graduates 25 and older in Miami (48%) is much lower than the Florida state average (74%).

Economic Characteristics

Both Fort Pierce (12.4% unemployed) and Miami (11.0%) have civil unemployment rates that are approximately twice the state unemployment rate of 5.8%; at 1.2%, Islamorada has the lowest unemployment rate of these communities. The 1989 income per capita for Fort Pierce and Miami are under $10,000; the 1989 income per capita is highest in Lighthouse Point ($28,696) and Islamorada ($24,651). In comparison, the income per capita for the state of Florida is $14,698.

The percentage of workers found in the *agriculture, forestry and fisheries* industry is highest in Fort Pierce (10%), Marathon (9%) and Islamorada (7%), while the state average is 3%. For the remaining communities, the percent employed by these industries ranges from 1-3%.

Fisheries Characteristics

Table 7.2 gives 1996 landings and permit information for the communities in East Florida likely to be affected by Fishery Management Plans.

Bluefin Tuna For bluefin tuna, only Cape Canaveral and Fort Pierce had landings over 1,000 pounds (dry weight). Pompano Beach and Dania also had sizable bluefin tuna landings. Fort Lauderdale, Fort Pierce, Islamorada, Key West and Miami all had over 20 commercial tuna permits each. Fort Lauderdale (42 permits) and Miami (51) had the most recreational tuna permits; the remaining communities all had less than 40 recreational tuna permits each.

Swordfish Miami had the largest number of swordfish landings at 12,332 fish; Pompano Beach and Fort Pierce had landings over 5,000 fish, although still less than in Miami. Lighthouse Point, New Smyrna Beach, Marathon, and Jacksonville also reported swordfish landings.

Large Coastal Sharks Landings of large coastal sharks were highest in Fort Pierce, Miami, and Port Orange. Shark landings were also found in New Smyrna Beach, Marathon, Jacksonville, and Saint Augustine.

WEST FLORIDA MAJOR HMS AND BILLFISH COMMUNITIES

Demographic Characteristics

The communities in West Florida likely to be affected by Fishery Management Plans are found in Table 7.3. The population of these communities taken from the 1990 Census ranges from over 200,000 in Saint Petersburg and Tampa to 2,602 in Appalachicola. With the exception of Madeira Beach, all of the communities had sex ratios that revealed a greater number of women to men. The percent of high school graduates 25 and older is highest in Gulf Breeze (93%) and lowest in Apalachicola (53%); the percent of high school graduates 25 and older for the state of Florida is 74%.

Economic Characteristics

At around 8% of the civilian labor force, Apalachicola and Panama City have the highest unemployment rates; at 2.8%, Madeira Beach and Destin have the lowest unemployment rate, three percentage points below the state average of 5.8%. For the 1989 per capita income, Apalachicola has the lowest, at $7,277, and Gulf Breeze has the highest, $21,243; the per capita income for Florida in 1989 was $14,698.

The role of the *agriculture, forestry and fishing* industry as an employer is strongest in Apalachicola, where approximately 5% of the population is employed in these industries. In Destin, Fort Myers and Tarpon Springs these industries employ 3-4% of the resident workers in each of these communities. In the geographic region of Clearwater, Madeira Beach, Saint Petersburg and Tampa, nearly 6% of the combined workers from these communities are employed in *agriculture, forestry and fishing* related industries.

Fisheries Characteristics

Table 7.4 gives landings and permits information for West Florida in 1996.

Bluefin Tuna Fort Myers had the highest landings at 650 pounds (dry weight). Commercial permits for tuna were most numerous in Destin (36 permits), Panama City (34) and Penasacola (27). There are 72 recreational tuna permits in Pensacola; the remaining communities have under 25 recreational permits each.

Swordfish Landings of swordfish are highest in Tarpon Springs and Fort Myers. However, if taken together as a geographic area, the swordfish landings of are over 1,400 fish.

Large Coastal Sharks Large Coastal Shark landings are below 300 sharks for each community; if taken as a geographical area, the shark landings of Clearwater, Madeira Beach, Saint Petersburg and Tampa are over 700 sharks.

TABLE 7.1
EAST FLORIDA COMMUNITIES AFFECTED BY FISHERY MANAGEMENT PLANS
DEMOGRAPHIC CHARACTERISTICS
Source: U.S. Bureau of the Census

Community	1990 Census Population	Sex Ratio M/F	% Married Family Households	% of High School Graduates Age 25 and over	Civil Unemployment Rate	1989 Per Capita Income	% Agriculture, Forestry & Fisheries Industry
Cape Canaveral	8,014	1.11	33.5	83.2	6.8	$16,397	1.5
Dania	13,024	0.93	39.1	60.6	8.9	$13,006	2.6
Fort Lauderdale	149,377	1.01	37.2	67.7	6.7	$19,814	1.8
Lighthouse Point	10,378	0.85	56.5	85.1	4.4	$28,696	1.3
Pompano Beach	72,411	0.93	44.7	73.7	6.3	$17,382	3.0
Daytona Beach	61,921	0.98	35.7	73.6	7.9	$11,901	1.6
New Smyrna Beach	16,543	0.86	54.0	79.4	6.9	$14,501	2.7
Port Orange	35,317	0.93	60.8	79.8	4.6	$13,391	1.6
Fort Pierce	36,830	0.89	43.0	56.9	12.4	$9,961	9.8
Islamorada	1,293	1.18	43.8	77.8	1.2	$24,651	6.8
Key West	24,832	1.14	44.4	79.9	3.3	$15,547	2.2
Marathon	8,857	1.10	52.6	72.0	3.9	$16,790	9.0
Jacksonville	635,230	0.95	53.2	76.4	5.7	$13,661	1.2
Miami	358,548	0.93	40.0	47.6	11.0	$9,799	1.8
St Augustine	11,692	0.90	42.2	75.7	5.6	$12,012	1.3

TABLE 7.2
EAST FLORIDA COMMUNITIES AFFECTED BY FISHERY MANAGEMENT PLANS
FISHERIES CHARACTERISTICS
Source: NMFS

	Bluefin Tuna Landings *dry wt in lbs*	Bluefin Tuna Landings *rank*	Commercial Tuna Permits *number*	Commercial Tuna Permits *rank*	Recreational Tuna Permits *number*	Recreational Tuna Permits *rank*	Swordfish Landings *# of fish*	Swordfish Landings *rank*	LC Shark Landings *# of fish*	LC Shark Landings *rank*
Cape Canaveral	1,553	2	9		11					
Dania	384	4	4		1					
Fort Lauderdale			24	1	42	2				
Lighthouse Point			2		8		687	5		
Pompano Beach	835	3	17	6	11		5,126	3		
Daytona Beach			8		23	5				
New Smyrna Beach			9		12	9	772	4	270	5
Port Orange			3		7				1,141	3
Fort Pierce	1,937	1	20	4	22	6	6,758	2	2,682	1
Islamorada			20	4	10					
Key West			24	1	2					
Marathon			11	10	6		291	7	320	4
Jacksonville			10		30	4	185	10	133	9
Miami			22	3	51	1	12,332	1	1,212	2
St Augustine			14	7	38	3			138	8

TABLE 7.3
WEST FLORIDA COMMUNITIES AFFECTED BY FISHERY MANAGEMENT PLANS
DEMOGRAPHIC CHARACTERISTICS
Source: U.S. Bureau of the Census

Community	1990 Census Population	Sex Ratio M/F	% Married Family Households	% of High School Graduates Age 25 and over	Civil Unemployment Rate	1989 Per Capita Income	% Agriculture, Forestry & Fisheries Industry
Apalachicola	2,602	0.86	45.4	52.9	8.0	$7,277	5.4
Clearwater	98,784	0.86	48.2	80.2	4.8	$16,726	1.1
Madeira Beach	4,225	1.04	43.7	83.8	2.8	$17,301	1.4
Saint Petersburg	238,629	0.86	44.4	75.1	5.2	$14,132	1.5
Tampa	280,015	0.93	42.2	70.6	6.7	$13,277	1.7
Destin	8,080	0.95	60.3	88.1	2.8	$19,018	3.9
Fort Myers	45,206	0.95	39.8	68.4	6.2	$12,329	3.2
Fort Walton Beach	21,471	0.94	56.9	85.9	5.5	$13,690	1.0
Gulf Breeze	5,530	0.97	64.4	93.2	5.1	$21,243	2.2
Panama City	34,378	0.88	48.7	70.3	8.1	$12,169	1.5
Pensacola	58,165	0.84	46.2	79.1	7.6	$14,795	0.7
Tarpon Springs	17,906	0.92	58.3	74.2	6.9	$13,557	3.2

TABLE 7.4
WEST FLORIDA COMMUNITIES AFFECTED BY FISHERY MANAGEMENT PLANS
FISHERIES CHARACTERISTICS
Source: NMFS

Community	Bluefin Tuna Landings *dry wt in lbs*	Bluefin Tuna Landings *rank*	Commercial Tuna Permits *number*	Commercial Tuna Permits *rank*	Recreational Tuna Permits *number*	Recreational Tuna Permits *rank*	Swordfish Landings *# of fish*	Swordfish Landings *rank*	LC Shark Landings *# of fish*	LC Shark Landings *# of fish*
Apalachicola	380	3	1							
Clearwater			3	7	1		201	7	108	5
Madeira Beach	251	5	14	4	1		600	6	174	4
Saint Petersburg			4	6	2		614	5	226	2
Tampa			1		3	7			265	1
Destin	650	1	36	1	20	2	931	3	220	3
Fort Myers	417	2	3	7	1		1,217	2	25	7
Fort Walton Beach			1		7	5				
Gulf Breeze			6	5	15	3				
Panama City	353	4	34	2	12	4	654	4	100	6
Pensacola			27	3	72	1				
Tarpon Springs			1		2		2,689	1		

EAST FLORIDA - ISLAMORADA COMMUNITY PROFILE

Islamorada calls itself the Sportfishing Capital of the World. The name was adopted in the 1950s by this small community because of the simultaneous proximity to the Florida Bay, the Everglades, bonefish flats, coral mountains and the Gulf Stream. One respondent claimed that "at one time or another they get just about every fish in the hemisphere." The history of fishing here dates back to the Large Key Fishing Club and Zane Grey. Presidents Bush, Truman, and Wilson, athletes, such as Ted Williams, and many movie stars have all fished here. Islamorada is famous for light tackle technique and many different rods have been developed. One respondent said "there would be nothing here if it were not for fishing. There are no beaches. There would be no grocery stores, nothing, not even utility companies."

DEMOGRAPHIC PROFILE

Population

According to the 1990 Census, the population of Islamorada is 1,293. There are more males (54%) than (46%) females.

Racial and Ethnic Composition

The racial composition is 95% White, 0.9% Black, and 3.8% other races. The highest incidence of a single ethnicity is found in residents with German ancestry, which make up 15%of the population.

Age Structure

Forty-four percent of the population are between the ages of 15 and 44 years. The population of those under 15 and those over 44 are approximately the same, suggesting an even age structure.

Marriage

Fifty-nine percent of people 15 years and older are married, 17% never married, and 17% are divorced.

Household Composition

According to the 1990 Census, Islamorada has 672 households, with an average of 1.86 persons per household. Out of this total, 52% are family households, and 48% are non-family households. Table 7.5 shows additional household information for Islamorada from the 1990 Census.

TABLE 7.5 HOUSEHOLD COMPOSITION ISLAMORADA, FL Source: U.S. Bureau of the Census	
Total Number of Households	672
Average Number of Persons per Household	1.86
Percent of Married-couple Family Households	43.8
Percent with own children under 18	9.8
Percent of Male Householder Family Households	2.5
Percent with own children under 18	0
Percent of Female Householder Family Households	5.4
Percent with own children under 18	3.3
Percent of Non-family Households	48.4
Percent of Householders Sixty-five or older	24.3

In Islamorada there are 966 housing units. Of the 646 occupied housing units, approximately 60% are *owner-occupied* and 40% are *renter-occupied*. Seventy-two percent of total vacant units are vacant for *seasonal, recreational, or occasional use*. Table 7.6 shows additional information for housing units from the 1990 Census.

TABLE 7.6 HOUSEHOLD INFORMATION ISLAMORADA, FL Source: U.S. Bureau of the Census	
Total Housing Units	966
Owner-occupied Units	394
Median Value	$138,400
Renter-occupied Units	252
Median Contract Rent	$456
Vacant Housing Units	320
Housing Units Vacant for Seasonal Use	231

Education Trends

Twenty-two percent of the 25 years and older population component are high school graduates, with just as many that did not graduate high school. Thirty percent of the population has some college but no college degree. Additional information from the 1990 Census on educational attainment is displayed in Table 7.7.

The Florida Keys Chamber of Commerce assert that the educational facilities in the Upper Keys are known for their high standards. There is one elementary schools and one high school in Islamorada.

TABLE 7.7
EDUCATIONAL ATTAINMENT
(PERSONS 25 YEARS AND OLDER)
ISLAMORADA, FL
Source: U.S. Source of Census

	# of Persons	% of Population 25 Years and Over
Less than 9th grade	104	9.6
9th to 12th grade, no diploma	137	12.6
High school graduate (includes equivalency)	222	20.4
Some college, no degree	322	29.6
Associate degree	53	4.9
Bachelor's degree	134	12.3
Graduate or professional degree	115	10.6

Economic Characteristics
Most of the county's growth since 1950 has been in the unincorporated area. Many people that moved into the region were retirees. By 1980, more people of Hispanic origin moved into the area and commuted throughout the region for jobs.

In mid 1970's local effort began to establish a tourist economy. By the 1980's, the tourist economy attracted a service oriented labor force (White, B. 1995).

Employment Of the residents 16 years and older, approximately 73% participate in the civilian labor force. The unemployment rate for Islamorada is 1.2% of the civilian labor force; this is significantly lower than the state unemployment rate (5.8%).

The predominant occupations by employment are *technical and administrative* occupations (31%) and *managerial and professional* occupations (26%).

Employment by Industry The five most dominant industries in terms of employment for Islamorada are *retail trade* (39.4%), *personal services* (12.5%), *professional and related services* (8.0%), *transportation* (7.2%), and *agriculture, forestry and fisheries* (6.8%). Table 7.8 gives additional information from the 1990 Census about employment of Islamorada residents by industry.

TABLE 7.8
EMPLOYMENT BY INDUSTRY
(EMPLOYED PERSONS 16 YEARS AND OVER)
ISLAMORADA, FL
Source: U.S. Bureau of the Census

Sector	# Employed	% Employed
Agriculture, forestry, and fisheries	**57**	**6.8**
Mining	0	0
Construction	32	3.8
Manufacturing, nondurable goods	15	1.8
Manufacturing, durable goods	23	2.8
Transportation	60	7.2
Communications and other public utilities	26	3.1
Wholesale trade	24	2.9
Retail trade	329	39.4
Finance, insurance, and real estate	48	5.7
Business and repair services	18	2.2
Personal services	104	12.5
Entertainment and recreation services	27	3.2
Professional and related services	67	8.0
Public administration	5	0.6
Total	835	100

Fishing Related Business There are a total of eleven marinas in Islamorada. Powerboat rentals are another tourist business with seven in the area. Other water related tourist businesses are boat tours, cruises, kayak, wave runner and sailboat rentals, ten snorkel and dive shops, eight boat dockage, lifts and repair shops, and four fishing supply shops. There are 26 lodgings in Islamorada, consisting of motels, bed and breakfast, resorts and inns, ranging from budget to luxury (Islamorada Chamber of Commerce). Local activities include fishing tournaments, golf and tennis clubs, bowling, museums and galleries, wild bird center and a theater of the sea where tourists can swim with dolphins, Indian Key and Lignumvitae historical and botanical tours, and a fossil reef state geological site. Route U.S. 1 is lined with shops, signs, boutiques, cottages, and multi-million dollar resorts. The islands also offer 18 specialty and general shops (Islamorada Chamber of Commerce).

FISHERIES PROFILE

Recreational Fishing

Recreational activities in the Keys consist of trophy fishing, catch and release, spear fishing, and fishing for food. The traditional past times for the area are reef, shore, and bridge fishing. The recreational fishing industry is increasing. More recently, there has been a growing interest in the guided fishing industry that promotes catch and release. (Bohnsack and Co-worker, 1994). According to the Florida Bureau of Vessel Titling and Registration, Monroe County has a total of 23,079 registered boats, with 18,731 pleasure and 4,260 commercial boats as of 1996. Respondents reported that fishing for billfish is nearly entirely catch and release. They feel that catch and release, bag and size limits, and other recreational measures are working. Florida's ban on inshore net fishing was also a success, sea trout are plentiful because of the net ban, as are bonefish, pompano, and Spanish mackerel. They are concerned with other commercial fishing activities, particularly drift gill nets and long lining for dolphin. A respondent said "One commercial person can make a living at the expense of thousands of others."

The largest resort in Islamadora began as a fishing marina and sportfishing is a big part of their marketing. Fishing is now just one aspect of the "resort experience" and people come to the resort and discover fishing. While charter captains report that they can see drops in bookings within a month of reports of bad fishing, the resort has never seen droppings in vacancy rates from such reports. The resort has two sets of boats offshore and "back country," the local term for the Florida Bay area. There are 19 "6 pack boats" which are charter vessels and 1 party boat. The resort arranges pickup charters. Boats that go offshore do fish for marlin, but this is not a big fishery nor do people regularly want to catch them. Charter captains report that marlin were never a big catch, they would get 15-20 in a summer in the early 1980s, now they get one. In the winter they fish for sailfish, black fin tuna, and bonito. Dolphin come in May.

Tournaments are an important marketing device and billfish species are used in the ads. The Holiday Isle Sailfish Tournament is a big one that is specifically marketed to tourists. During tournaments occupancy rates are 100 percent. They advertise in sportfishing magazines, direct mail and through local media. The majority of boats in Islamadora tournaments are Florida boats, but there are some out of state participants. Some of the tournaments generate donations to charity. The Holiday Isle Dolphin Tournament, for example, gave $2500 this year to the American Cancer Society. The Tourist Development Council is a Keys-wide para-statal organization that is supported by a bed tax. They have a large marketing budget and they give grants and sponsorship to tournaments. The will also help with marketing expertise. The Council has three sections: the Fishing Umbrella supports tournaments; the District Advisory Council supports general tourist events; and a third section supports cultural events.

A new, very large, tackle shop is an addition to a national chain. They are surpassing a business plan that they felt was ambitious in the first place. This shop employs 57 people. The shop has a number of local suppliers that includes manufacturers of lures and jewelry as well as local distributors of fishing products. They are going to begin a fishing school next year that will employ 6 teachers and teach 24 people at a time for 3-4 days. They will teach fly casting, different types of fish, how to find fish etc. Their customers are 80 percent tourists.

According to a marine extension agent from the Monroe County Cooperative Extension Service, fishing is doing better as a result of regulations. Despite the marine extension agent's sentiment, the charter captains are pessimistic about the future. They feel that the overall fishing picture is not good. For 3 years the dolphin have been slow in July and August, four years ago it was very good. Last year they experienced their first loss of customers in the late summer as a result of depressed dolphin catches. Customers read the fishing press and drops in catch will start to have an affect on charter bookings with about a month lag. They are getting a lot of Europeans who want amberjack and sharks. They used to be able to catch hammerhead but these are now "dinosaurs." They have lost customers to places like Costa Rica because they want to catch marlins. Additionally, good mates are hard to find. There is no "recruitment stock." Young kids do not grow up thinking they will be charter boat captains. The future looks bleak. They fear that the whole Keys could "become like St. Petersburg, all rich retirees and the marinas all private boats."

Commercial Fishing

There are only two small longline boats that dock in Islamadora (see the Pompano Beach profile for a description of this fleet). Monroe County commercial landings data for the Islamadora area show 10,647 lbs of dolphin, 4,136 lbs of shark, 711 lbs of tilefish and no swordfish (Center for Economic and Management Research 1995). The Keys overall have important commercial fisheries. Major fisheries are shellfish such as shrimp, stone crab and lobster, having an annual dockside value of about $45 million in the Keys area. Florida Keys National Marine Sanctuary proposed a "no take" zone policy in the next 10 years, which will put many commercial fishermen out of business (Sheldone 1996). King and Spanish mackerel recovered after 15 years of protection by the state and federal regulatory agencies. Finfish fishery consisting of snapper, grouper, and mackerel do about $9 million annually in dockside value. There are also snapper resources such as yellowtail, gray and mutton snapper. (Gregory 1996).

FISHING MANAGEMENT ISSUES

Comments Raised by Respondents

Another local problem is the taxidermy scam (described in the Pompano Beach profile) that is a concern, but the community strongly frowns on landing sailfish. Some people land them and say that they died because they were tail hooked. When this happens people will grumble, especially if they do it 2-3 times a season. People will always start asking questions.

There is a general concern in Islamorada that it would be devastating to the community if the fish stocks are depleted. There are a lot of concerns with habitat such as the loss of grass beds, destruction of mangrove shoreline, water quality, algae blooms, and coral reefs dying from ozone depletion and too much sunlight. Flat fishing depends on knowing the tides because of water pollution, since local water conditions deteriorate when dirty water from the Gulf and Florida Bay comes through the Keys. Twenty years ago, one responded related, there was a lot of clear water with grass, now the grass is not seen due to sewage and pollution. They are concerned with runoff from the lower part of the peninsula including phosphates and exhaust. There is also a concern over loss of fish in the area due to the use of certain gear types, and an increasing number of fishermen.

EAST FLORIDA - POMPANO BEACH COMMUNITY PROFILE

Pompano Beach is small city directly adjacent to Ft. Lauderdale FL. It is very much a part of the dense urban complex which extends along the coast north of Miami. The Ft. Lauderdale area is known as the “Yachting Capital of the World” and the “Venice of America “ because of the vast canal system which extends throughout Broward County and create 165 miles of waterfront in the region. Pompano Beach is also a globally important manufacturing center for commercial longlining equipment.

DEMOGRAPHIC CHARACTERISTICS

Population

The 1990 population Pompano Beach was 72,411 and the population estimates for 1993 and 1996 are 74,876, and 74,583 residents, respectively. There are more females (52 %) than males.

Racial and Ethnic Composition

The racial composition of Pompano Beach is approximately 70% White, 29% Black, and less than 1% other races. The highest ethnic group of a single ancestry is Hispanic, which comprises approximately 20% of the population; populations corresponding to all other ethnic groups in the 1990 Census occur at a rate of less than 10% of the population each.

Age Structure

Approximately 40% of the population are between age 15 and 44, according to the 1990 Census. Forty-five percent of the population is over age 44, while only 15% are under age 15; this suggests an aging population.

Marriage

In the 1990 Census, 53% of the population 15 years and older were married. Of those not currently married, 25% were never married, 11% were widowed and 11% divorced.

Household Composition

According to the 1990 Census, Pompano Beach has 31,891 households, with an average of persons per household. There are 58% are family households and 42% are non-family households. Table 7.9 gives additional information on households in Pompano Beach.

TABLE 7.9 HOUSEHOLD COMPOSITION POMPANO BEACH, FL Source: U.S. Bureau of the Census	
Total Number of Households	31,891
Average Number of Persons per Household	2.17
Percent of Married-couple Family Households	44.7
Percent with own children under 18	10.9
Percent of Male Householder Family Households	3.5
Percent with own children under 18	1.2
Percent of Female Householder Family Households	9.8
Percent with own children under 18	4.6
Percent of Non-family Households	42.1
Percent of Householders Sixty-five or older	37.7

According to the 1990 Census, there are 42,719 housing units; approximately 25% are vacant. Of the 32,157 occupied housing units, 63% are owner-occupied and 37% are renter-occupied. Seventy-three percent of the vacant housing units are vacant due to seasonal use. Table 7.10 gives additional information regarding housing units.

TABLE 7.10 HOUSING STRUCTURES POMPANO BEACH, FL Source: U.S. Bureau of the Census	
Total Housing Units	42,719
Owner-occupied Units	20,343
Median Value	$99,300
Renter-occupied Units	11,814
Median Contract Rent	$470
Vacant Housing Units	10,562
Housing Units Vacant for Seasonal Use	7,635

Education Trends

According to the 1990 Census, 73.7% of the residents of Pompano Beach 25 years and older are high school graduates. Table 7.11 gives additional information on educational attainment.

TABLE 7.11
EDUCATIONAL ATTAINMENT
(PERSONS 25 YEARS AND OLDER)
POMPANO BEACH, FL
Source: U.S. Bureau of the Census

	# of Persons	% of Population 25 Years and Over
Less than 9th grade	5,331	9.8
9th to 12th grade, no diploma	9,029	16.5
High school graduate (includes equivalency)	16,759	30.7
Some college, no degree	10,115	18.5
Associate degree	3,380	6.2
Bachelor's degree	6,855	12.5
Graduate or professional degree	3,191	5.8

Economic Characteristics

Income The per capita income for Pompano Beach in 1989 was $17,382; this is higher than the state per capita income ($14,698) but lower than the per capita income for Islamorada ($24,651).

Employment Of the residents 16 years and older, nearly 56% participate in the civilian labor force. The unemployment rate for Pompano Beach is 6.3% of the civilian labor force; this is only slightly higher than the state unemployment rate (5.8%).

Employment by Industry Of the 15 main industries in Pompano Beach, the five most dominant in terms of employment are: *professional and related services* (19.8%), *retail trade* (18.6%), c*onstruction* (10.4%), *finance, insurance, and real estate* (9.3%), and *business and repair services* (6.5%). *Agriculture, forestry and fisheries* industries employed 3.0% of the population for the 1990 Census. Table 7.12 gives additional information on the industries in Pompano according to the 1990 Census.

TABLE 7.12
EMPLOYMENT BY INDUSTRY
(EMPLOYED PERSONS 16 YEARS AND OVER)
POMPANO BEACH, FL
Source: U.S. Bureau of the Census

Sector	# Employed	% Employed
Agriculture, forestry, and fisheries	**958**	**3.0**
Mining	28	< 0.1
Construction	3,303	10.4
Manufacturing, nondurable goods	796	2.5
Manufacturing, durable goods	1,921	6.0
Transportation	1,260	4.0
Communications and other public utilities	823	2.6
Wholesale trade	1,729	5.4
Retail trade	5,936	18.6
Finance, insurance, and real estate	2,962	9.3
Business and repair services	2,067	6.5
Personal services	1,935	6.1
Entertainment and recreation services	732	2.3
Professional and related services	6,305	19.8
Public administration	1,101	3.5
Total	31,856	100

FISHERIES PROFILE

Recreational Fishing

The week we visited Pompano Beach they were celebrating the "50th Year of Yachting" in Ft. Lauderdale. A local yacht manufacturer reported that he sells 58' yachts worth 3,000,000 dollars and he estimates that 85% of the boats he sells are used for fishing. "These people" he says "are very serious about fishing." People in the area have been making boats since the 40s.

Recreational fishing is a very important activity in Pompano Beach. According to Florida's Bureau of Vessel Titling and Registry, in 1996-97 Broward County had 44,151 registered boats, with 41,393 pleasure and 2,043 commercial boats. In contrast to many Florida communities, a substantial amount of the recreational industry is supported by local people in addition to tourists. One indicator of this is a large number of small, local fishing tournaments that respondents estimate attract about 75 percent local people and 25 percent tourists. Tournaments generate money for charity, the 1998 Pompano Beach Ladies Tournament raised $33,500 for charity. Many of these tournaments target billfish, but these are sailfish rather than marlin.

Sailfish are very important for promoting tourism in the Pompano Beach area. Tournaments play an important role in attracting tourists, especially in the otherwise "dead" month of May.

Local activities include an Annual Sea Food Festival in April, and a Rodeo tournament. In 1996 the Rodeo has increased to 722 angler entrees with 221 boats. The Rodeo tournament, a popular event among the tourists and locals, is held every year. It started in 1965 to encourage tourists to stay in the area longer. Today the Rodeo is known internationally and the non-profit activity supports marine conservation and educational programs. It has grown since 1966 when there were 79 anglers on 47 boats that entered the tournament. By 1994 there were 667 anglers on 261 boats establishing a tournament industry standard. There were 95 winners that year with more than $60,000 cash given out among them (Hardie 1995).

While most tournaments are non-profit, there have been, and are, several attempts to set up for-profit tournaments is a competitive business. The Salt Water Anglers Association tried for four years to have a local tournament circuit in which a series of tournaments would to a set of grand prizes. It was difficult to get sponsors for a 40 boat tournament. Several respondents indicated that the issue of luck versus skill is crucial to a tournaments success. The problem with the local inshore tournaments is that if the fishery requires skill the same people are always going to win. People want to enter tournaments that are more luck-based.

Catch and release of billfish is actively promoted among recreational fishers by such organizations as the Billfish Foundation and the International Game Fish Association, where it has been policy for 15 years. The Miami Billfish Tournament was the first to decide to go with just catch and release. The idea had been that people would cheat when prizes were as high as $10,000. They went to 100 percent release by doing lie detector tests and observers. Several respondents reported that people have begun to accept catch and release as normal practice even in tournaments.

Commercial Fishing

Pompano Beach has a small longline fleet, remnant of a much larger fleet, that mainly targets tuna and swordfish. There is also some shark fishing farther north along the coast. The boats that dock in Pompano Beach are five small (40-50'), short trip year round longline boats, and six or seven seasonal longline boats. There are some larger boats in nearby Dania. December through April is the most intensive local fishing. The resident fleet stay and are joined by many boats from the that north come down to fish for the winter. From April through the end of June the larger sized boats found in fish in the South Atlantic bight and land most of their catch at Charleston SC. The smaller boats fish year round in the Gulf of Florida. If swordfish is closed fall is mainly used for maintenance. The longline fleet deals with two fish houses in Pompano Beach and one in Dania.

Commercial fishers in Pompano Beach are proud of the role they have played in the development of the longline industry. They relate that monofilament longline was created and perfected in Pompano Beach. A group of charter boat captains, the "Mosquito Fleet," began experimenting with longlines and various fish attraction devices in the 1970s. Three of these people opened

what one respondent claims was the fish house to specialize in pelagic fish. A related company built the first distant water swordfish fleet in the South.

By the early 1980s the fleet was developing and the geographical range of operations was increasing. They sold the smaller boats and the captains were moving into 68' boats that could move north and follow the fish. They moved from short trips to week long trips. By 1983 they were fishing on George's Bank and would be gone for 2-3 weeks. The Pompano Beach longliners began to invest in even larger boats in the mid-80s. This meant, however, that the best captains were gone for longer and longer times. Family problems, divorces and dislocations began to be issues in the fleet.

By the late 1980s, the eight largest boats in the Pompano fleet had been sent to Hawaii. Even with this increased range the fleet was feeling pressure from several sources. The better captains began to get out of the business because they had to travel so much. The mates that took over were less skilled and this increased the amount of time that the home offices had to spend on absentee management. Trade agreements were increasing competition with imported fish. ICCAT restrictions were becoming tighter and, several respondents feel, the US fleet was being restricted more, or at least more effectively, than its foreign competition. With Bahamian independence the fleet lost access to waters near the Bahamas which had been very important for the smaller (~50') longline boats. More recently, the swordfish boycott has depressed prices for the higher quality swordfish that is bread and butter of the smaller boats. A captain told us that they do catch smaller swordfish. The smaller boats catch some swordfish under 30 lb, and a 41 lb size limit would mean throwing back substantial amounts of fish and considerable loss in income. The development of the Pompano Beach area for yachting and recreational fishing has made dockage and access to the water more expensive. Swordfish closures have reduced income by shifting effort to less valuable. One fish dealer reports that before the closures his business was 88 percent swordfish and 12 percent tuna, now he does 59 percent swordfish, 12 percent tuna and 29 percent dolphin. Bluefin tuna landings rank third in East Florida ports for 1996 in Pompano Beach, with 835 pounds. There were 5,126 swordfish caught ranking third and 71sharks ranking sixth.

All commercial respondents reported increased difficulty in getting quality crew. The small boats take two crew plus the captain. Owner operators often try to have at least one crew member that they keep with them. Then they try to find anyone they can for particular trips. Respondents reported that as recently as four years ago crew used to line up for work. Now captains have to shop around and the quality is lower. A fish dealer estimates that about half the captains he deals with are married, with an average age of 35, but some are much older. While about half of them are what the dealer describes as "societies poor souls." They are unskilled, recalcitrant individuals who don't want welfare and don't like authority. They go to sea and then get some money and live in a hotel. The other half , who often come from fishing families, want to be captains. There are also some crew who are captains up north and come down and crew for the winter. There is also the occasional college student on winter break.

The end result of all of these factors has been a very substantial reduction of the Pompano Beach longline fleet. For example, the company that sent the eight boats to Hawaii, and owned ten other

longliners as well, now owns only two boats. They say that they own these boats only because the grandchildren want to stay attached to the commercial fishery. This company has successfully developed other aspects of their business. Pompano Beach's remaining fleet is considered, both by its owners and suppliers as being in major trouble. Respondents blame both regulations and absence of swordfish from the Straights of Florida. There are few alternative fisheries. Snapper, king mackerel, and red crab are all closed, limited entry fisheries. Dolphin, however, is a profitable alternative during the spring swordfish closure.

Fishers, and other businesses related to commercial longlining in Pompano Beach, are increasingly turning their attention overseas. The best captains are still the ones that go the farthest, but now it is often to work on foreign boats in foreign waters. One longline equipment supplier reported that only 15% of his business is domestic. He has seen sales of longline equipment in Chile double three times since the early 1990s. When he first went to Uruguay in 1990 they had one boat, now they have 10, Brazil's 3-4 longline boats are now 30-40. Another supplier began his business specifically because of the opportunity he saw in the export of longline gear. The East Coast of the US is 30% of his business. He does not see Americans investing in new fixed equipment but people are still replacing equipment when they have to. He describes the East Coast US longline fleet as currently the least technically sophisticated of all the fleets he supplies.

There is a Florida Commercial Fishermen's Association that is not involved very much in pelagic fisheries. Some longliners are members of the Blue Water Fishermen's Association.

FISHERIES MANAGEMENT ISSUES

Additional Comments Offered by Respondents

Several members of the recreational industry expressed concern about a practice of some charter boat captains. When a customer catches a billfish, they ask them if they want to kill it and have it mounted. The idea is that when the customer has already killed the fish he or she is less likely to back out of the deal upon discovering the cost of the mount. When the customer leaves, however, they throw the fish away and the customer gets a fiberglass replica. The contract is written in such a way that this is technically legal and nothing can be done even if the customer finds out.

There is a great deal of tension between the recreational and commercial fishing groups. Both sides acknowledge a problem with over fished stocks but each often blames the other side. Regulatory discards (having to throw saleable fish back dead in order to comply with regulations) are very demoralizing. They are seen by many as an affront to fishing as a way of life.

WEST FLORIDA - MADEIRA BEACH

Madeira Beach is part of the Tampa Bay urban complex, one of several beach suburbs of St. Petersburg FL. It is a highly developed urban area in a county where tourism is the number one industry. The area is also the central port for the West Central Florida longline fleet.

DEMOGRAPHIC PROFILE

Population

The 1990 population of Madeira Beach was 4,225, and population estimates for 1993 and 1996 are 4,319 and 4,383. There are more males (51%) than females (49%).

Racial and Ethnic Composition

According to the 1990 Census, the racial composition for Madeira Beach is predominantly White (99.8%). The highest group of single ancestry in the ethnic composition of Madeira Beach consists of people of German ancestry (11%).

Age Structure

Thirty-nine percent of the population are between age 15 and 44. While only 7% are under age 15, well over half (54%) are over age 44; this suggests an aging population.

Marriage

In the 1990 Census, 55% of the population 15 years and older were married. Of those not currently married, 20% were never married, 12% were widowed and 13% divorced.

Household Composition

According to the 1990 Census, Madeira Beach has 2,230 households with an average of 1.88 persons per household. Of these households, the number of family and non-family households are approximately the same, at about 50% each. Table 7.13 gives additional household information for Madeira Beach.

TABLE 7.13 HOUSEHOLD COMPOSITION MADEIRA BEACH, FL Source: U.S. Bureau of the Census	
Total Number of Households	2,230
Average Number of Persons per Household	1.88
Percent of Married-couple Family Households	43.7
Percent with own children under 18	7.5
Percent of Male Householder Family Households	3.1
Percent with own children under 18	1.4
Percent of Female Householder Family Households	3.8
Percent with own children under 18	1.0
Percent of Non-family Households	49.5
Percent of Householders Sixty-five or older	33.5

The 1990 Census identifies 3,788 housing units in Madeira Beach, 41% of which are vacant. Of the 2,230 occupied housing units, approximately 58% are *owner-occupied* and 42% are *renter-occupied*. Fifty-three percent of the vacant housing units are vacant due to seasonal or occasional use. Table 7.14 gives additional housing information for Madeira Beach.

TABLE 7.14 HOUSING INFORMATION MADEIRA BEACH, FL Source: U.S. Bureau of the Census	
Total Housing Units	3,788
Owner-occupied Units	1,290
Median Value	$111,800
Renter-occupied Units	940
Median Contract Rent	$392
Vacant Housing Units	1,558
Housing Units Vacant for Seasonal Use	828

Education Trends
According to the 1990 Census, nearly 84% of the residents 25 years and older are high school graduates. Additional information on educational attainment is located in Table 7.15.

TABLE 7.15
EDUCATIONAL ATTAINMENT
(PERSONS 25 YEARS AND OLDER)
MADEIRA BEACH, FL
Source: U.S. Bureau of the Census

	# of Persons	% of Population 25 Years and Over
Less than 9th grade	154	4.2
9th to 12th grade, no diploma	440	12.0
High school graduate (includes equivalency)	1,139	31.2
Some college, no degree	937	25.7
Associate degree	277	7.6
Bachelor's degree	487	13.3
Graduate or professional degree	218	6.0

Economic Characteristics

Employment Of the residents 16 years and older, nearly 59% participate in the civilian labor force. The unemployment rate for Madeira Beach is 2.8% of the civilian labor force; this is approximately half of the state unemployment rate (5.8%).

Looking at the most predominant occupation in the area, *managerial and professional* occupations rank the highest in employment (35%), followed by *technical and administrative* occupations with (31%).

In Madeira Beach, approximately 78% of those employed are *private for profit wage and salary workers;* 8% are *self employed*.

Employment by Industry The five most dominant industries in terms of employment are *retail trade* (30.7% of employees 16 years and older), *professional and related services* (20.9%), and *construction* (8.8%). *Agriculture, forestry and fisheries* industries make up a very small sector of the industry in Madeira Beach (1.4%). Table 7.16 gives additional information on industries in Madeira Beach.

TABLE 7.16
EMPLOYMENT BY INDUSTRY
(EMPLOYED PERSONS 16 YEARS AND OVER)
MADEIRA BEACH, FL
Source: U.S. Bureau of the Census

Sector	# Employed	% Employed
Agriculture, forestry, and fisheries	**31**	**1.4**
Mining	0	0
Construction	196	8.8
Manufacturing, nondurable goods	57	2.6
Manufacturing, durable goods	110	4.8
Transportation	66	3
Communications and other public utilities	55	2.5
Wholesale trade	101	4.5
Retail trade	682	30.7
Finance, insurance, and real estate	127	5.7
Business and repair services	69	3.1
Personal services	135	6.1
Entertainment and recreation services	56	2.5
Professional and related services	464	20.9
Public administration	75	3.4
Total	2,224	100

In terms of revenue, tourism is the number one industry in Pinellas County. Annually, four million visitors contribute about $2 billion dollars to the economy. Twenty-three percent of all retail sales in Pinellas county can be attributed to tourism, generating more than $189 million per year in tax revenue. The tourism industry also employs almost 60,000 of the residents either directly or indirectly, adding up to $720 million in wages (St. Petersburg/Clearwater Visitors Bureau brochure, 1998). Visitors add only 10 percent of the traffic in the county but their taxes pays for almost half the road maintenance and construction. According to the Visitors Bureau, tourists in the St. Petersburg/Clearwater area in 1997 contributed 1.7 million dollars, which went toward conserving the beaches; these tourists also provided revenue through visitors taxes that help support libraries, museums, health agencies, mass transportation, and other facilities.

Income The per capita income for Madeira Beach in 1989 was $17,301; this is higher than the state per capita income ($14,698) and considerably higher than the per capita income for Panama City ($12,169).

FISHERIES PROFILE

Commercial Fishing

The offshore fishing industry in Madeira Beach started as a bandit (electric reel) fishery before it turned to bottom longlining. Grouper is the traditional fishery for the community. In the 1960s there were two fish houses supported by charter boats selling fish and a small commercial fleet grew up fishing for kingfish and grouper. Many species which today are sold, such as amberjack, were considered junk fish. As demand for fish began to grow, higher prices accompanied by investment programs such as a 10% investment tax credit and health insurance made available for the merchant marine and related industries, lead to substantial investment in commercial fishing.

The first attempt at longlining in the early seventies failed. Two longline boats began to fish but did not catch anything and the local fishers decided that it was a loser. Madeira Beach fishers had never fished for tuna, swordfish or shark, indeed, there was no market for shark in those days. Swordfish longliners began in fish in earnest in the early seventies. They started swordfishing using cloth line, and white and black nylon line, before monofilament longlining began to spread. The local stocks of swordfish shrunk quickly and a group of boats went up the Eastern Seaboard looking for fish. On their way back they threw their gear out in deep water and caught a very large catch of tilefish and yellow edge grouper. This was how the bottom longline fishery in Madeira Beach got started. Marginal swordfish boats began to experiment with various techniques such as straight hooks, auto-baiters and circle hooks. These boats were now too small to be successful at swordfishing in this area because of increased steaming distances. They did not make as much money doing bottom longlining as they had at swordfishing, but they did make more money than the bandit fishing. Today swordfish landings are ranked sixth out of top fifteen in West Florida ports with 600 caught in 1996-97.

The current fleet at Madeira Beach is 95 percent longliners. One dealer could not name what he thought of as a successful bandit boat at his dock. He estimates that a 100 boats unload in Madeira Beach. There are four fish houses, two of which deal with pelagic fish. Table 7.17 shows recent changes in the species breakdown of landings at one of these two houses.

Table 7.17: Species Composition (Percent) of Landings to a Madeira Beach Fish House

Species	1994	1995	1996	1997	1998
Grouper	46	48	52	52	55
Snapper	12	8	5	11	8
Shark	27	30	20	10	11
Other	15	14	23	27	26

Many fishers have multiple permits and a substantial number are grouper fishing. A dealer estimated that before restrictions on shark fishing his business used to be 45 percent grouper, 45

percent shark, and 10 percent sword and tuna, now it is 75 percent grouper, 10 percent shark and 15 percent sword and tuna. Grouper are subject to size and area restrictions, and a 9 million lb quotas. That has not been reached for several years. The fisheries use different gear for grouper, shark, and swordfish and tuna. Grouper is a wire cable while the pelagics are monofilament, although some fishers fish grouper with a monofilament mainline using weights to sink it. The maximum number of trips they can make is about 15 trips a year, as a grouper trip lasts 18-20 days. Several respondents estimated a very good grouper trip as landing about 10,000 lbs gross The break even point for a 10,000 lb trip is two dollars per pound and the price is greater than two dollars pound for about half the year. Respondents estimated that all of these factors together means an average of 150,000 dollars gross a year, which cannot support a very large boat. Fishers also report that they do not enjoy grouper longlining as much as they do other species. Grouper fishing requires at least three people working 18-20 hour days. It often works out to below minimum wage. Mexican grouper fishing has created a lot of competition in the last decade. The Mexicans have little effective regulations and there are no import controls. Madeira Beach dealers believe that the Mexicans have a marketing plan to keep the cost of imported grouper about 10-15% lower than American grouper. It is not as good as the domestic product and this quality difference helps protects the US business from the price difference. However, grouper is often cut and fillet so it is hard for end users to know what they are getting.

Some fishers keep both grouper and shark gear on board. When shark fishing began it was easy to catch shark, but has become marginal because of restrictions and the distances they now have to steam. Shark trips have to be kept as short as possible to maintain the meat at good quality. They go to Louisiana and Texas and land their fish in Venice LA and Galveston TX, usually doing a double trip in a month of 22-23 days. This is a long and costly steam. The meat is not valuable, getting only 50-60 cents a pound. The low price does reduce competition from imports that can't compete because of the shipping costs. The real value is in the fins which are sold mainly in Asia. Respondents suggest that regulations, particularly the 4000lb shark trip limit, are turned the fishery into a small boat fishery. Even boats as small as 50' can have difficulty making a profit. One boat owner reported that he had been making $75-100,000 a year fishing for shark with a 62' foot boat before the 4000lb trip limit put an end to it. The problem with longline trip limits, respondents argue, is the number of trips the boat does not reach the limit. This boat owner used to count on getting two or three trips in the 11,000 lb range and four of five trips in the 5,000 lb to balance the other trips that got less than 4000 lbs. The trip limit made fishing for shark on a 62' boat impractical so he sold his boat and bought a smaller one.

Yellowfin tuna is an important Gulf of Mexico fishery in general but it requires still a third kind of gear, as well as a larger boat because of steaming distances. Currently, few boats land tuna in Madeira Beach and their catches are low. Success in tuna fishing is also sensitive to captains skills, especially in comparison to longlining grouper Yellowfin meat has to be kept at a high quality as it is sold for steak. A good fisher can get a 30,000 lb trip of yellowfin tuna. Fishers prefer tuna fishing in contrast to grouper. They do not have to work more than 14-16 hours a day and they make more money. Some people also fish for tilefish. Large Golden Tilefish is still a source of good money. Respondents could name only two boats still actively catching swordfish.

Antagonism and competition between fish houses has gotten worse in recent years as boats drop out of fishing, often being sold out of the country. The houses use both credit and price to compete for fish supplies. Some of the fishers shop around while others like to stay with one dealer that they trust. "Shopping around makes you listen to too many BS stories" one fisher explained. Many of these boats are living trip to trip and often need credit for engine repair, ice, fuel and even household and personal items. A dealer said "to keep a guy fishing you have to sustain his life, even give advances to wives." Both the fishers and an engine supplier reported that the commercial fleet is spending more on maintaining what they have rather than buying more. The fishers report that the boats are going downhill for lack of money for maintenance. It is very hard to get a loan for a boat. "Even NMFS will not give loans" one remarked. One dealer, however, has found himself giving loans for capital improvements on boats. "We are in too deep. This is damage control" he explains.

Fish houses use several strategies to try to respond to the changing industry. One has a close business relationship with a restaurant chain which gives them the funds they need to compete price-wise. Fifteen percent of the business now goes to the restaurant chain and they would like this percentage to go to 100% because this is how they feel they can stay competitive. They have also started to buy fish from Florida's east coast. Another house has tried to keep supplies up by running a boat in Nicaragua. It has been difficult and time consuming to ride this work because of distance, infrastructure, and a lack of facilities.

Crew are a continuing problem. One owner operator said that he has had to bail every crew that ever worked for him out of jail. "Fishing attracts felons" he says, and even when they are making a lot of money they will fail to report to work. Some crew give no social security numbers and do everything in cash. Drugs are also a problem. One respondent said "It is no easy job, no showers, they are living in a shack for two weeks at sea for no money." Years ago, a respondent recalls, they had young kids all over the dock. Now there are few young people. Mates are often transients from up north or running from the law. Several respondents reported that the best captains are leaving to out of the country or to other jobs. Some become laborers. One boat owner became a diesel mechanic. Fishers do not want their children to go into fishing. Several respondents combined could only name three captains that use family as a crew. There were many more fishing with family 20 years ago.

Finding employees for the fish houses is also difficult. One dealer reports that he ran an add for three weeks for a driver and got five applications. This position started at 7 dollars and hour and offered health and profit sharing. He estimates that this difficulty in finding people has been around for about five years. Finding skilled fish processors is much tougher. The last time this dealer hired a processor was in February 1998 and it took 3 months to find someone.

Madeira Beach fishers are represented by the Southern Offshore Fisherman's Association (SOFA) who have been heavily involved in shark management issues. This organization once had 1000 members, but now they are down to 40 boats. They represent reef fish and shark fishers.

One of the central events to Madeira Beach as a fishing community is Seafood Festival. This festival began in 1979 when a change in the main road bypassed the old John's Pass village which was a central commercial fishing dock. Businesses were threatened by the bypass and some community leaders decided something had to be done. They decided to have a fish fry and SOFA put it on. This developed into the John's Pass Seafood Festival. It has grown to be one of the largest events in the area. The first time they got 10,000 people and they were overwhelmed: people sat on their cars, it was bedlam, they got 10,000 people. Now people come 120-120,000. It takes place on the last full weekend of October. In 1997, because three people were doing almost all the work, the Gulf Beaches Chamber of Commerce were given operation of the seafood festival and they sold spaces to members of the chamber. This caused SOFA to be unable to participate and this created some tension in the community. In 1998, the chamber have refused to do it because they made only $13,000 dollars last year.

The relationship between the fishing crews and the local merchants has often been tense. The fishers are accused of contaminating the water and of not being good for Madeira Beach in general. There used to be many more fishers and there were places for them to go to socialize. SOFA used to have a club house with a bar for members only, but this is now closed. Respondents say that there is a great deal of tension within the fishing community as well friends have been pit against friends. During one interview a respondents said "Right this minute they are getting ready for the shark opening. Some boats are out already, ready to land the fish the second it opens [note that this is a violation of fisheries regulations]. The other see this and feel cheated. There will be some phone calls turning these folks in. They don't want to report but they will.... If I could get out I would." A dealer did a informal poll of his fishermen if they would get out if they were bought out for a fair price, 50 percent said yes.

Recreational Fishing

Participants in recreational fishing for billfish in Madeira Beach are some of the most dedicated and prosperous recreational fishers. Marlins are the most important species to this group and, because these fish are 100 miles off shore in this area. Marlin fishing is a very expensive sport. A marine engine dealers pointed out that today's offshore recreational fishers are not people who have a lot of time. Hence they need fast boats to get themselves offshore for a weekend fishing trip. One enthusiast reported that he spends $100,000 a year on fishing. Marlin fishers feel that it takes a lot of dedication to fish for marlin when most people would be content to dive, or fish for grouper, trout or redfish. Marlin fishers in the Madeira Beach area are local owners of private boats. A charter captain who has fished in the area for many years estimates that 50-60 private boats do it. A small group indeed, considering that Pinellas county has a total of 48,285 pleasure boats registered, according to the 1996-97 Florida Bureau of Vessel Titleing and Registration. Some tourists ask about fishing marlin but the recreational industry does not advertise it. Marlin fishing does have a symbolic importance in spite of its few participants. Its is a glamour sport. Newspapers and TV stations cover it. It is an important public face of recreational fishing. In the Madeira Beach area many marlin enthusiasts are members of The Old Salts Fishing Club.

Marlin fishing is very important to people who do it. One respondent says that he does not like any other type of fishing. People decide what boat to buy on the basis of marlin fishing and this respondent, a tackle shop dealer, has seen cases where the decision was make as a direct result of

wanting to enter a billfish tournament. One friend of his said that if it was not for marlin tournaments he would not fish and this tackle shop owner feels the same way some see. The boat and fishing as a family thing. Offshore fishing is a bonding experience for adult fathers and sons as well as with younger sons. One respondent described it as " almost tribal." People become different, they assume nicknames and play different roles that strengthen their on-shore relationships. Respondents believe that membership in fishing clubs has increased in the past 10 years due to better and more popular fishing

Billfish have never been important for Madeira Beach charter boats because they are so far off shore. It is expensive and logistically difficult. The only charter captain that does billfish says that about 30 people a year ask him about it. These are always all tourists here on vacation who take it in their heads to catch a marlin. He tells them how much it costs and the difficulty and they usually change their minds. Charter for billfish has no impact at all on the Tampa economy.

The tackle store owner reports that he sells about $100,000 a year in billfish equipment. Billfish tackle is highly seasonal. The season for selling begins just before April through the first part of September. About 10% of his sales of this kind of tackle is for use elsewhere, even overseas. An emerging catch and release ethic has had a slight negative effect on business. They no longer sell flying gaffs that cost $350.00 each instead they are selling $30 tag sticks. They don't even sell resuscitation equipment, because anglers just hold the fish by the bill. The size of tackle has gone down. They used to fish marlin with 80lb now it is 50lb because losing the fish is less of a concern. The owner supports catch and release and is happy to accept these losses.

The tackle store sells very little shark tackle, but our respondent believes it is beginning to come back. The store used to do an estimated $15,000 a year in shark leaders that they manufacture themselves and sell to other dealers in the county. They had not sold any for 10 years until this past year when they have begun to get a few orders. In 1985 the center span of the Sunshine Skyway bridge was smashed and an entire new bridge had to be build. The miles-long remainder of the old bridge is now used as two huge piers and people shark fish from these piers. The piers have bait houses and rest rooms on them. A respondent estimates that shark fishing is 90 percent release. "Nobody wants that toothy thing in the boat" one recreational fisher said. Some recreationalists blame longline overfishing for diminishing the shark population. One result may be an increase in the stingray population, as some believe sharks are a key predator of this species. These animals sting people who step on them on the beach. The charter captain says that he knows of one shark bite in 6 years but that three or four people probably get stung by a stingray every day. There is concern that the stingrays will eventually make Madeira Beach a less attractive tourist destination.

Billfish tournaments are staged out of John's Pass in Madeira Beach and the Tierra Verde Resort, which is in another town. Four tournaments target billfish. In one tournament this year e 80 boats released 42 billfish. The Old Salt Club holds a billfish tournament in June out of Tierra Verde. There are three others out of John's Pass on the new moon of July, August, and September. There had been shark tournaments in the past but they are no longer held.

Tournaments attract tourists. Most of them are sponsored by a boat or engine manufacturer and the grand prize is often a boat. One company recently doubled their budget for tournament sponsorship because they saw it as one of their most important marketing channels. Tournaments also produce funds for charity. Treasure Island Charities was started in 1992 to support marine conservation efforts. They raise money through fishing tournaments and have given support to the Florida Conservation Association, The Tampa Bay Watch, and the Florida League of Anglers. They are a 501 c 3 charity in their 6th year. They also support children's charities. They made donations of $450,000 last year, half to each of these causes.

FISHING MANAGEMENT ISSUES

Comments Raised by Respondents

The question of catch and release billfish tournaments is a divisive one in the Madeira Beach recreational fishing community. There are some full release tournaments and others kill. The full release use colored lines that are attached to the fish and a photograph or video taken. The participants don't know the color scheme that will be used until the captain meeting before the tournament. This makes it impossible to fake a photo or video of a captured marlin beforehand. In these tournaments, size does not matter as long as it is legal, the rules give points for number of legal sized fish released for each species. The Billfish Foundation tournaments and the Florida West Coast Billfish championship are catch and release. When the Madeira Beach tournaments became full release a number of captains dropped out. They were afraid of "unsportsman-like behavior." They want to bring fish to the dock so that no questions are asked.

The recreational and commercial fishing communities in Madeira Beach have a tense relationship with one another. Recreational fishers recognize that the area was partially built on commercial fishing, but still express "bitterness" that the commercial industry has " abused and raped the resource." Recreationalists see the commercial fishers as suffering from a situation that they themselves have created. One recreationalist complained that commercial fishers "waste bycatch and use game fish in reduction fisheries." Several recreational fishers expressed pleasure about the results of Florida's ban on inshore net fishing. They are beginning to see bait again inshore. They also complain that illegal fishing goes on. One respondent says that e still sees gill nets being used and fishing in restricted areas. People report violations but they are ignored because the Florida Marine Patrol lacks manpower.

There are mixed attitudes towards imposing more recreational permits. One respondent says that he already spends at least $1000.00 a year on permits, user fees and taxes in fishing. He would like to see an accounting for this money before he agrees to another permit. requiring permit. Others take the stance that they will accept whatever it takes to preserve the stock.

The commercial fishers are very upset with the results they have gotten from helping fisheries scientists with research. SOFA members feel that they have helped a great deal in research and then had the results "cooped," "misinterpreted" and used against them. They feel that fisheries scientists have an agenda that they fit the science to. They also complain that they do not get compensated for helping with research.

WEST FLORIDA - PANAMA CITY COMMUNITY PROFILE

Panama City is a summer tourist destination on the Gulf of Mexico in Florida Panhandle. It is a small city that serves as a regional center. Fishing and golf are the two activities that attract the most tourists. It is one of the top fishing destinations on the panhandle. The city is also an important commercial fishing port.

DEMOGRAPHIC PROFILE

Population

The 1990 population of Panama City was 34,378, and population estimates for 1993 and 1996 are 35,650 and 35,986 residents, respectively. There are more females (53%) than males (47%).

Racial and Ethnic Composition

The racial composition consists of primarily White (76%) and Black (21%) residents. The highest occurrence of a single ancestry group is those of Hispanic origin which make up 25% of the population.

Age Structure

Approximately 43% of the residents of Panama City are between the ages of fifteen and forty-four, according to the 1990 Census. Thirty-seven percent of the population is above age 44 and 20% are under age 15; this suggests an aging population.

Marriage

In the 1990 Census, 55% of those 15 years and older were married. Twenty-three percent of those 15 and over were never married, 10% were widowed and 12% were divorced. Of those widowed, 15% were men and 85% were women.

Household Composition

Panama City has 14,033 households which have an average of 2.38 persons per household. Out of this total, approximately 66% of households are family households and 34% are non-family households. Table 7.18 gives additional household information for Panama City.

TABLE 7.18 HOUSEHOLD COMPOSITION PANAMA CITY, FL Source: U.S. Bureau of the Census	
Total Number of Households	14,033
Average Number of Persons per Household	2.38
Percent of Married-couple Family Households	48.7
Percent with own children under 18	20.1
Percent of Male Householder Family Households	2.9
Percent with own children under 18	1.5
Percent of Female Householder Family Households	14.1
Percent with own children under 18	8.6
Percent of Non-family Households	34.3
Percent of Householders Sixty-five or older	27.8

In the 1990 Census, there are 15,928 housing units in Panama City; approximately 12% of these households are vacant. Out of the total occupied housing units approximately 58% are owner occupied and 42% are renter occupied. Six percent of the vacancies are due to seasonal use. Table 7.19 gives additional housing information from the 1990 Census for Panama City.

TABLE 7.19 HOUSING STRUCTURES PANAMA CITY, FL Source: U.S. Bureau of the Census	
Total Housing Units	15,928
Owner-occupied Units	8,193
Median Value	49,800
Renter-occupied Units	5,860
Median Contract Rent	279
Vacant Housing Units	1,875
Housing Units Vacant for Seasonal Use	107

Educational Trends

Approximately 70% of the population 25 years and older are high school graduates. Additional information on educational attainment from the 1990 Census is found in Table 7.20.

TABLE 7.20
EDUCATIONAL ATTAINMENT
(PERSONS 25 YEARS AND OLDER)
PANAMA CITY, FL
Source: U.S. Bureau of the Census

	# of Persons	% of Population 25 and over
Less than 9th grade	2,763	12.1
9th to 12th grade, no diploma	3,995	17.5
High school graduate (includes equivalency)	6,282	27.6
Some college, no degree	4,314	19.0
Associate degree	1,626	7.1
Bachelor's degree	2,530	11.1
Graduate or professional degree	1,280	5.6

Panama City is 297th out of 343 metro areas that were ranked for the educational index by the US Department of Education's Directory post-secondary institutions, public, private college and universities. A branch of Florida State University is located in Panama City with more than 1,000 students enrolled presently. Bay county public schools provide education for more than 130,000 people within 758 square miles. The school district is the 21st largest in Florida, according to the Bay County Lifestyle web site.

Economic Characteristics

Income and Poverty The per capita income for Panama City in 1989 was $12,169; this is lower than the state per capita income ($14,698) and considerably lower than the per capita income of Madeira Beach ($17,301). Panama City's 1993 cost of living is ranked 37th based on the data from Florida County Comparisons released by the Florida Department of Commerce (Bay County Lifestyle web site, 1998).

Employment Approximately 57% of the population 16 years and older participates in the civilian labor force, according to the 1990 Census. The civilian unemployment rate is 8.1% of the civilian labor force; this is higher than the state unemployment rate (5.8%).

Looking at the most predominant occupation in the area of people 16 years and older, *technical and administrative* occupations rank the highest (32%), followed by *managerial and professional* sector (26%).

Employment by Industry The five dominant employment industries in Panama City are *professional and related services* (25.2%), *retail trade* (21.4%), *public administration* (7.9%), and *construction* (7.0%). Nearly 8% of those employed work in the *manufacturing* industry (durable and nondurable goods); the average manufacturing wage is $13.65 (Bay County

Lifestyle web site, 1998). *Agriculture, forestry and fisheries* industries rank as one of the smallest sectors in Panama City with only 1.5% that are employed in this sector. Table 7.21 gives additional information on Panama City industries from the 1990 Census.

TABLE 7.21
EMPLOYMENT BY INDUSTRY
(EMPLOYED PERSONS 16 YEARS AND OVER)
PANAMA CITY, FL
Source: U.S. Bureau of the Census

Sector	# Employed	% Employed
Agriculture, forestry, and fisheries	**218**	**1.5**
Mining	12	< 0.1
Construction	994	7.0
Manufacturing, nondurable goods	504	3.6
Manufacturing, durable goods	588	4.2
Transportation	607	4.3
Communications and other public utilities	432	3.1
Wholesale trade	470	3.3
Retail trade	3,018	21.4
Finance, insurance, and real estate	941	6.7
Business and repair services	704	5.0
Personal services	749	5.3
Entertainment and recreation services	208	1.5
Professional and related services	3,563	25.2
Public administration	1,113	7.9
Total	14,121	100

FISHERIES PROFILE

Commercial Fisheries

Panama City has nine offshore longline boats that target yellowfin tuna during most of the year. Some of these will target shark when that fishery is open, dolphin in the summer, and swordfish more and more rarely. Some boats carry gear for yellowfin tuna and shark. Two of these boats are owner operated, two are owned by a fish house, three are each owned by a single person who hires a captain, and two others are owned by the same person who hires captains. There are also 16-19 grouper boats and one distant water swordfish boat operating out of Panama City. There were 654 swordfish caught in 1996-97 which ranked fourth out of the top 15 West Florida ports. In the early 80s, yellowfin tuna was the main fishery for Panama City from April through December and in the winter they targeted bluefin tuna. Some also sold marlin until it was declared a gamefish in 1985. In the beginning of the bluefin tuna fishery, fishers knowledge of

quality and marketing grew only slowly and prices were low, although they seemed very high at that time. Then Japanese fishers and buyers began to come directly to the Gulf of Mexico. Panama City boats sold bluefin tuna at regular auctions in Dulac and Venice LA and Galveston TX during what a respondent described as "the prime years" of the early 1990s. They had a quota of 110 tons and they could bring in 2 fish per day in trips that lasted 4-5 days. He estimates an average price on $20.00 per lb during these peak years. This fishery was considerably reduced by the incidental category requirement, that at that time, 2500 lbs of other fish be landed along with bluefin tuna. The Panama City fishers see the problem with this being that there is little else for them to catch when the bluefin tuna are around because this is the slow season for yellowfin tuna. The system created a serious discard problem. Fishers would catch an bluefin tuna and keep fishing for their ratio. In the meantime, if they caught a bigger bluefin tuna or one that stood a higher chance of being better quality when they brought it to dock, the first bluefin tuna would go overboard.

Some of the longline boats are shifting from yellowfin tuna fishing to grouper fishing. One gave two main reasons for this 1) the yellowfin bait became harder to get and 2) crews have become hard to get. Grouper can be fished with fewer people. Another fisher also offered crew as the primary reason he has shifted from yellowfin tuna to grouper. Grouper can be fished with a captain and two crew, tuna requires a captain and four crew. A respondent said that a captain trying to fish for tuna with three men has to pilot the boat and haul the gear at the same time. Several boats have quit fishing for bluefin tuna altogether. Just this year one changed to lighter test line and circle hooks because they want to avoid bluefin tuna bycatch. A fish trader reported that in 1998 he bought three fish in Dulac LA and three in Galveston TX for an average price of five dollars a pound. In 1993 he estimates that he would bought 50-60 at a much higher price. He also estimates that the average size of the fish brought in has dropped 20 percent. With the current system, respondents complained, they never catch their quota and it is given to the general category.

This fish trader's current business is 87 percent yellowfin tuna, eight percent snapper, with the remainder being a mix of swordfish, bluefin tuna, dolphin, wahoo and escolar. He buys from an estimated ten boats now when he used to buy from 30 a few years ago. When he bought from 30 boats he employed six full time and two part time employees. Now he employs two full time and one part time. He sells yellowfin tuna steak to wholesalers all over the U.S. One key concern he relates is that when yellowfin tuna are caught by Mexicans and imported into the US they are not marked as a product of Mexico.

Most of the boats he used to buy from have gone to Mexico. The boats that are going are the larger boats able to go out for two weeks or more. One respondent believes that the reasons are more plain economics than regulations, although regulations certainly play a part. The larger boats are just too big to make money catching the 50-70 fish than they catch. Smaller boats can survive on 50-70 fish. The other reason is the difficulty of recruiting crew. Another fisher who is trying to sell his boat gave crew problems as the main reason he wants out.

One explanation for the difficulty in finding crew, which was mentioned by more than one person, is a large amount of the tourist-related construction in the area. Respondents see the

quality of the crew as decreasing. Trips are harder, money is less, the crew get afoul of the law with child support or DUI. Alcohol is a problem. One owner had to fire a mechanic who brought alcohol on the boat and recruited one mate who stole money from him. Captain decides on pay shared based on negotiations with the crew. The crew on the tuna boat gets $800-1200 a trip and the captain gets $3000-6000 thousand. They do about 1.5 trips per month.

Another fisher who sold his boat to Mexico pointed to a specific law as his reason to do so. Panama City fishers used to fish in Mexico and this was legal as long as they did not catch dolphin, wahoo, or swordfish. Tuna fishing was legal for them to catch outside 12 miles. In the early 1990s the US government banned fishing in Mexican waters for US boats. The fishers feel that Mexican fishers have many advantages over them. They believe that they fish under no effective regulations and Mexico is not a member of ICCAT, yet they are able to ship bluefin tuna into the US that is sold on the same auction blocks as US bluefin tuna.

American captains go to Mexico "to get the big bucks" and to get their own boats, a respondent related. Several feel that the most skilled fishers either left or are leaving. One owner said that the last time he had to recruit a captain it took him two months to find him. Owners are competing hard for good captains.

Most Panama City longliners do not see themselves as having an organization. Some are members of Blue Water Fishermen's Association. One long time fisher said that people see Blue Water as oriented toward the north because that is where most of the membership is. "It is a catch 22. People from down here won't join and say they won't because they ignore the issues of people down here who don't join. "

Recreational Fishing

Panama City rates as one of Florida Panhandle’s top fishing centers. It offers surf fishing, pier fishing with five piers, twelve Charter and party boat fishing with fourteen marinas in the Panama City Beach, according to the Panama City Tour Guide. According to the Florida Bureau of Vessel Titling and Registration Bay county has a total of 16,865 registered boats with 15,359 pleasure and 1,433 commercial boats.

Panama City is a summer resort with little tourist activity in the winter. In winter they bottom fish and fish for bluefish, which are around all year. In March their season begins in earnest with Spanish mackerel, cobia, snapper, bonita, little tunny, amberjack, can snapper, red porgies, rudder fish, blue runner, bluefish, and redfish. By summer they also have king mackerel, dolphin, wahoo, little tunny, and barracuda. Late summer offshore they get blue and white marlin and sailfish which can be caught anywhere. In September they catch "a little of everything" and from October until it gets cold they fish King mackerel again and bonitas. There are 12 recreational permits in Panama City, compared to 15 other nearby areas Panama City ranks fourth. In summer Panama City fishing is only 20 percent local anyway, 80 percent are tourists coming especially from Tennessee, Georgia, Alabama and North Carolina. They come mainly to go bottom fishing. Motivations have changed. It used to be that people were interested in catching a lot of fish and taking it home to eat or sell. Now people are satisfied to catch anything.

One charter captain says that about five percent of his customers ask for marlins, he does nothing to discourage this, although the price is higher. They must go a minimum of 50 miles off shore. Some charter captains specialize in this but nobody does just marlin. Marlin attracts tourists more than locals. If you advertise, you can get marlin charters in July to September. Most of the marlin customers are not experienced fishers. Marlin is catch and release save in tournaments.

Shark fishing became popular after the movie "Jaws." The shark season peaks in July and historically the fishery peaked in the mid 1980s. One captain declared one day that he would no longer fish for shark and he has had no noticeable decline in business. From the 1st of May you catch shark haphazardly in hot weather. Some charter boats will go shark fishing at night for extra income.

Party boats are an important part of Panama City's fishing attractions. They fish bottom fish. One owner with several boats offers 12 hour, six hour and nine hour excursions. The day before the interview (in June) 33 people went on the 12 hour while the half day got 170. People want to go out as a family and make an excursion of it. This is not possible on the longer trips because the children can't take it. The children are excited to be on a boat and it is an outing that is about fellowship more than catching a lot of fish. "You would think that what they would be concerned with is catching a nice bunch of fish but this is usually not the case. The 170 people boat caught rock bass" he related with some disgust. His party boats are sold out every day by 10 O'clock.

A tackle store owner related that five to ten percent of his business is shark related and a now defunct shark tournament generated 80 percent of that. He has seen a definite change in shark related tackle sales, down by about half. Tackle sales have not changed as a result of catch and release but there has been a tendency for lighter tackle all around. People don't care that much about boating the fish except in tournaments. This has actually increased sales because a large, offshore private boat will keep two sets of tackle, quotidian and tournament. Marlin tackle is about 15 percent of his business. People do come to Panama City to catch marlin and the Billfish tournaments have a huge economic impact.

Tournaments are the center of the Panama City recreational fishing community. There is a very large billfish tournament in July. Other important tournament are a king mackerel tournament in September and a smaller blue marlin tournament in September. There used to be a shark tournament, it was stopped two years ago.

The organizer of the large tournament estimates that participants spend at least $20,000 in the weekend of the tournament. They buy fuel, ice, entertainment, aircraft for spotter planes, hotel rooms, bait shops, limos, and beer. The marina sells 40,000 gallons of diesel fuel in 4 days, 275 40lb bags of ice, $25,000 in t-shirts. The organizers meet the tournaments needs with local businesses as much as possible. They spends $5,000 on a tent, $10,000 for a temporary add on to the marina and $5,000 for a PA system. The tournament gets 10,000 spectators. The tournament is for "Southern good old boys." If you are young and from the south and interested in billfish you want to be here. The prizes are $100,000 for first place, $50,000 second place, and $40,000 third place. More important than the money, he says, is the way they publically honor the winner. It is not the money it having just beaten "the cream of the crop." They stopped taking white

marlin 2 years ago because of concern with the state of the stock. "It is bad enough to kill the blues." The structure of the prizes, he explains, is such that a diminishment of the stocks will not hurt the tournament. If only one marlin is caught that person gets $190,000.

The shark tournament started in 1980 and went to 1996. The change that the fishery went through in that time was dramatic and the organizers, a tackle shop, felt that the recreational fishery was wasting a lot of fish and that the resource was threatened. The tournament was not a big revenue generator through entry fees, but would draw people from a couple of hundred miles away. They did not want it to get too big. It was already filling the shop parking lot and blocking the road. The main reason for doing it is that tournaments are good advertising. One reason they quit was because the decline of the stock and conservation concerns would lead to negative associations for the tackle shop.

Panama City tournaments generate substantial contributions for charity. An invitational tournament auctions their last spot for charity. Then the next highest bids are used to order alternates who will enter if a spot becomes available. Any money these alternates have bid for the spot beyond the standard entrance fee is also given to charity. In 1997 they he raised $20,000 for an orphanage this way. All the fish caught are also sold for the orphanage. This was $3,500 in 1997. The tournament also donates $2,500 each year to the Billfish Foundation. The shark tournament did not generate enough money to give charity directly. However, they generated funds for charity through t-shirt sales, selling lemonade, and the like. They also donated the fins to a children's charity.

The catch and release idea has been growing. In the 1970s, one three day tournament in Panama City killed 146 marlin. Catch and release of billfish has become the daily habit. Charter boats might bring in a first kill but it is not common. All the respondents dealing with tournaments felt that catch and release tournaments in Panama City would not successfully be generating business and revenue for the community. Catch and release attracts elite fishers but not the general public. These tournaments are designed to be spectator sports. One respondent suggested that this part of Florida is very different from the peninsula, where catch and release tournaments are catching on. People who fish here feel that the longliners are killing a great many of blue marlin as bycatch, so it can't hurt if they take one marlin in a tournament. Otherwise it would be unfair. One tournament has people radio in when they catch a potentially prize winning marlin. They estimate the size and all the boats are informed. Then they will only kill a fish that is larger than the one that has been caught already. In recent years their tournament has never killed more than six blue marlin.

FISHERIES MANAGEMENT ISSUES

Additional Comments Offered by Respondents

One respondent was troubled by the complexity of the alternatives for shark that differ by different species. He is an expert shark fisher and he still used a shark book during the shark tournament. He feels that across the board shark rules, except perhaps for easily recognized species such as mako, nurse, or hammerhead, would be more effective. Recreational fishers are not experts and he is concerned that confusion will lead to fewer trips.

The billfish tournament organizer believes that the 113" slot size limit would be a real problem. Most fish that are wining in his tournament are between 86" and 113".

The commercial fishers in Panama City are very concerned with the possibility of any limited entry system because of their experience in the snapper fishery. NMFS asked them to shark fish in the 1990-1993 to relieve pressure on the snapper. If any limited entry system is considered for shark then these same years should be used. There is some anger over the fact that snapper fishers can fish for grouper but the grouper fishers can't fish snapper. People are fishing for species only to keep permits active, snapper regulations have made people very defensive. Some felt that species by species management in general does not account for the way fish are. Whenever you fish you impact other species.

Some commercial fisheries feel that if they can't land marlins that the recreational fishers should not be able to do so.

Fishers who fish for shark are specifically concerned about the proposed size restrictions. The shark they want most is the sandbar which is 30-80 because it has the best valued fin. A size limit of 58 inches would mean throwing out 40-50 percent of their catch.

CHAPTER 8 - PUERTO RICO

DEMOGRAPHIC PROFILE

Population

According to the 1990 Census Data, the total population of the island is 3,522,037; 1,705,642 are men and 1,816,395 are women. Nearly 98% of the people in Puerto Rico were born in the island

or in the US. The remaining population is split between naturalized citizens born in a foreign country and non-US citizens.

Households, Income and Poverty
In Puerto Rico, there are 1,057,357 households, of which 84.2% are family households. There are 1,022,544 families. Twenty-three percent of the family households have female householders; the poverty rate among them is 69.9%. The general poverty rate for the island is approximately half of the households (50.9%). Thirty-one percent of the households are receiving some kind of public assistance; the average public assistance income is $2,115. Sixty-three percent receive salary or wage income; average personal wage is $11,094. The median household annual income is $8,895 and the average household income is $15,509.

Education
Just over half (52.6%) of the adult population of Puerto Rico are high school graduates, according to the 1990 Census. Approximately 10% of the adult population can not read or write. Table 8.1 gives additional information on the literacy and education levels in Puerto Rico.

TABLE 8.1
ADULT LITERACY AND EDUCATIONAL ATTAINMENT
PUERTO RICO
Source: U.S. Bureau of the Census

	# of Adult Persons	% of Adult Persons
Adult population	2,368,151	100.0
Adults not able to read or write	245,291	10.4
High school graduates	1,245,733	52.6
College degree	302,883	12.8

Employment
Of the population age 16 and older, 47.1% are in the civilian labor force. The unemployment rate is approximately 20%. Tables 8.2 and 8.3 give additional information from the 1990 Census on employment in Puerto Rico.

TABLE 8.2 LABOR FORCE PARTICIPATION PUERTO RICO Source: U.S. Bureau of the Census	
Population 16 years or older	2,491,592
Civilian labor force	1,174,676
Labor force participation	47%
Unemployed workers	239,940
Unemployment rate	20.4%

TABLE 8.3
EMPLOYMENT BY SELECTED INDUSTRIES
PUERTO RICO
Source: U.S. Bureau of the Census

Industry Sector	% Employed in 1990	% Employed in 1993
Agriculture, forestry and fisheries	**4**	**3**
Manufacturing	17	17
Transportation and public utilities	19	20
Wholesale and retail trade	19	20
Services	21	23
Public administration	23	22

In general terms, the fishing industry of Puerto Rico is made up of private clubs for the upper and middle class and small, poor artisanal fishing communities whose physical facilities are provided by the state (villages). There are no big fishing ports on the island. The main exceptions are the two tuna processing plants in Mayaguez that import fish from all over the world.

The Sea Grant Program at the University of Puerto Rico at Mayaguez estimates that there are 30,000 recreational fishers in Puerto Rico whose landings are not registered. Permit data from 1996 contains two cases of commercial tuna permits. In both of these cases, the landings were registered in the continental US. There are approximately 2,500 licensed artisanal fishers who are required to report their landings to the Office of Natural Resources' Fisheries Laboratory. However, interviews and informal conversation with artisanal fishermen suggests that the reported numbers do not accurately reflect the situation on the beaches. Due to political problems and discontent with the management plans imposed by the local and the federal government, fishers will tend to report less fish than they are actually catching. Officials with the Office of Natural Resources report that the inshore stocks in Puerto Rico are badly overfished and declining rapidly.

At the state level, the Office of Fisheries Development, which operates under the Department of Agriculture, offers aid to fishers for purchasing motors and vessels. Few artisanal fishers take advantage of these programs because the program is set up so that the fishers have to put in their money up front and wait for the Office's reimbursement. The fishers are quick to point out that if they had the money to invest in the first place, they would not have to ask the Office for help. This office is also in charge of administering the facilities of the fisher's villages. The Fisheries Laboratory (*Laboratorio Pesquero*) is in charge of compiling the fisher's statistics. However, the numbers they have correspond only to the artisanal fishers; no one compiles the landings of the recreational fishers and no record is kept of their fishing activities. The Commissioner of Navigation in the Office of Natural Resources awards licenses. However, a license is not required for recreational fishing; in fact, it is not even required for artisanal fishing. Economic incentives from the Office of Fisheries Development are the only benefits linked to having a commercial license. There are only approximately 2,500 artisanal fishers with licenses, and many of them do not actively fish; these inactive fishers have licenses in order to obtain discounts on vessels and annual registration. Fishing laws are enforced through the Office of Natural Resources' Rangers. At the local level, there are artisanal fishers' associations (villages) and the recreational fishers' membership clubs.

The fishing industry is not a prominent economic activity in Puerto Rico and variations in fishing incomes have little impact on the island's economy. The recreational fishers and tourism related to sports fishing are concentrated geographically near the capital city of San Juan. There are Sports Fishing Associations and private clubs with marinas. Most of the charter boats and the big private clubs are located in the area of San Juan. The artisanal fishers' communities are found throughout the island. These communities are extremely poor and are considered artisanal, due to their use of the same fishing practices as their ancestors used during the last century. Artisanal fishers' communities will be the most affected by the regulations. For this reason, and because of problems with the validity of official data on landings and permits, the two municipalities (*municipios*) of Aguadilla and Arecibo were chosen for this study. Also, the extremely deep inshore waters of these areas make billfish and other highly migratory species accessible to the artisanal fishery as well as the recreational fishery. Fishing communities are small concentrations of fishermen found along the shore within the *municipios*, which are the primary political divisions of Puerto Rico. The Census Bureau treats a *municipio* as the equivalent of a county in the US. The fishing community in Aguadilla depends almost exclusively of the tuna and dolphin. Recreational fishers from other areas go to Aguadilla to fish for marlin and other pelagic species. Both communities have artisanal fishers' organizations, recognized by the Office of Fisheries Development, with physical facilities for the marketing and handling of the fish provided by the state. Both municipalities also have private clubs of recreational fishers.

AGUADILLA COMMUNITY PROFILE

DEMOGRAPHIC PROFILE

Population

The total population of Aguadilla is 59,335, of which 29,026 are men and 30,309 are women. Approximately 99% of the population of Aguadilla were born in Puerto Rico or in the US. In the US ethnic classification system the majority of the population will be classified as Hispanic or Latino. Naturalized citizens and non-citizens each make up less than 1% of the population of Aguadilla, but their ethnicity is unknown.

Households, Income and Poverty

Aguadilla has 15,302 family households. The median household income is $7,116. Thirty-seven percent of these households are receiving some kind of public economic assistance; the average public assistance income is $2,106. Nearly 56% of the households are receiving salary or wage income; the average household wage is $15,034 and the average personal wage or salary is $11,394. Twenty-three percent of the family households are female headed and 80% of these households are below the poverty level. The general poverty rate in Aguadilla is 57.3%

Education

Just under half (47.1%) of the adult population of Aguadilla are high school graduates, according to the 1990 Census. Approximately 11% of the adult population can not read or write. Table 8.4 gives additional information on the literacy and education levels in Aguadilla.

ADULT LITERACY AND EDUCATIONAL ATTAINMENT
AGUADILLA, PR
Source: U.S. Bureau of the Census

	# of Adult Persons	% of Adult Persons
Adult Population	40,373	100.0
Adults Not Able to Read or Write	4,722	11.7
High School Graduates	19,029	47.1
College Graduates	4,321	10.7

Employment

Of the population age 16 and older, 43.8% are in the civilian labor force. The unemployment rate is approximately 28%; this is higher than the unemployment rate for all of Puerto Rico (20%). In 1990, the highest employing industries for men and women were *manufacturing* and *services*. Tables 8.5 and 8.6 give additional information from the 1990 Census on employment in Aguadilla.

TABLE 8.5 LABOR FORCE PARTICIPATION AGUADILLA, PR Source: U.S. Bureau of the Census	
Population 16 years or older	42,374
Civilian labor force	18,576
Labor force participation	43.8%
Unemployed workers	5,149
Unemployment rate	27.7%

TABLE 8.6
EMPLOYMENT BY INDUSTRY
AGUADILLA, PR
Source: U.S. Bureau of the Census

Industry Sector	# of Males Employed	# of Females Employed	Total Employed	% Employed in 1990
Agriculture	425	32	457	1.9
Silviculture and fishing	**55**	**5**	**60**	**0.2**
Mines extraction	29	0	29	0.1
Manufacturing	2,982	2,840	5,822	24.4
Construction	1,320	52	1,372	5.8
Public services	1,122	197	1,319	5.5
Wholesale commerce	828	308	1,136	4.8
Retail commerce	2,832	1,120	3,952	16.5
Finance, insurance and real estate	275	204	479	2.0
Services	2,944	3,209	6,153	25.7
Public administration	1,982	1,143	3,125	13.1

Artisanal and Recreational Fisheries

Every artisanal fishers' association in Puerto Rico has a fish dealer, called the *acaparador,* who is named by the organization. The *acaparador* buys all the fish caught and resells it in small fish shops to restaurants or small seafood places. While these fish shops are the places in which they store, handle and sell the fish, these also serve as the fishers' organizations' headquarters. The restaurants who buy from these fish shops are local businesses specializing in seafood cuisine, usually owned by locals. The seafood places are *kioskos* where workers, usually fisher's wives, make light seafood and snacks such as fried turnovers (*empanadillas*) and corn sticks (*surullos*), and homemade food for the fishers, local visitors and tourists. These seafood restaurant, along with individual consumers buying directly from the fish shops and the local fishers, constitute the

small businesses related to the artisanal fishing industry in Aguadilla. In terms of the recreational fishing industry in Aguadilla, only one private fishing club contributes to this sector. There are no charter boats here and there is not a tourist industry oriented to this kind of activity. The sport fishers in Aguadilla are local boat owners. Also, there is no businesses specialized in fishing equipment or vessels. That is true for surfing but not for sport fishing.

According to the local government officials, fishing is minor in terms of the economic activities in Aguadilla. The artisanal fishers do not play an important part in the supply of seafood to local business because many restaurants are buying frozen fish instead of fresh products. At the same time, the sport fishing and the tournaments in Aguadilla are only for the locals, which does not represent an important source of income for the municipality from outside visitors. The economic sector that has been promoted by the local government is the tourism industry, especially with the project of the boardwalk, or *paseo tablado*. The local government is expropriating all the land near the beach in order to continue with this project. An unusable marina, which was made a few years ago with a total cost of $6 to $7 million, is planned to be fixed by the School of Engineers. Due to errors during the construction of the marina, the area is full of sand and cannot be used by large vessels, as was its original purpose. The reconstruction of this marina is an important political issue in the area of Aguadilla, one which has created intense conflicts between the different fishers' organizations as well as between the fishers and the local government.

Fishing Communities

In Aguadilla, the fishing communities are not necessarily where the fishers' live; instead these communities are the places in which the fishers get together during the day before or after a fishing journey. In the case of the artisanal fishers, a small facility serves as a common place from which all they sell their catch together, as well as their association's office. More than a business relationship, what ties them together to this place is the tradition and the strong social networks among them. There are three defined sections of Aguadilla that we can consider as artisanal fisher's communities - Crash Boat, Higuey and Tamarindo. As for recreational fishers, there is only one small private club in Aguadilla, located in the Barrio Higuey.

The community of Crash Boat is just between the mountains and the sea; it has a small sandy beach with a little bay. There is only a parking lot, which is in very bad condition. The *yolas*, which are the traditional artisanal fisher's vessels in Puerto Rico, are found on the beach. These vessels are between 18 and 22 feet long and completely open. They are made of wood and fiberglass, and constructed by hand most of the times. The Association of Commercial Fishers of Crash Boat is the fishers' association in this community. The facilities for the association consist of a one-floor building surrounded by a fence. However, a sign that the association is well organized is the relatively good shape of its facilities. The previous facilities of the cooperative are abandoned and located in the proximity of the new ones.

The second fishing community in Aguadilla is the Barrio Higuey. It is an urban area, just between downtown Aguadilla and the sea. There is a street that borders the shore where the fish

shops are located. In the shore area there is evidence of a boardwalk; however, the structure is totally ruined and useless. There is no beach, just rocks and water due to the construction of a marina that has interrupted the natural flow of sand in the island; the sand had served as protection for the coast from tsunamis *(bravado)* and provided a place for the *yolas*. Today, the houses on the waterfront and the highway do not have any protection from the water, which spills over into the street during bad weather. Local artisanal fishers have to climb the stone beach with their *yolas* until they reach the highway edge. The artisanal fishers have made requests to the municipal government for permission to put wood panels above the rocks to facilitate the transport of the *yolas*. According our key informants, in the past ten years that area has changed very much. In the past there were a lot of *kioskos* and the fishers had access to almost all the coast near the town. However, now the *kioskos* are abandoned and in ruins. All that is left is a part of a boat ramp and around ten to fifteen *yolas* situated in the rocks. The community only has a small fish shop that also serves as the headquarters of the Fisher's Association of Higuey. According to informants, the mayor has followed an agenda of displacing the fishers, expropriating their land near the coast and putting them in public housing downtown because of a project to improve the tourist industry in the area. Almost in front of the solitary boat ramp there is a relatively new, but small, private club called *El Parterre*. It is a private club but one that is using facilities of the local government. The government rents the building to the club, except for an office that is used by the Department of Natural Resources for its Rangers.

The Fishers Association of Higuey has nineteen members, and there are five independent fishers in the surrounding areas, all of which are men. The only female was the wife of one of the fishers. The average age among the fishers of this area is over forty; therefore, there is a problem of succession. The Association's fish dealer is a widow of one of the fishermen. After her husband died, the fishermen gave her the opportunity of being in charge of the fish shop so she could pay her house and family expenses. Among the species they fish are tuna, red snapper, bonito, and fish for bait. The tuna season goes from June until August. The swordfish are not targeted, but are a bycatch. A few years ago, sharks were abundant and caught frequently as a bycatch; however, now sharks have become very popular and are not so common anymore. The fishing arts they use are the *palangres* (longlines) of no more than 400 meters. Among the nineteen members, one does not have any type of formal instruction. While he does not know how to read or write, he is owner of the fishing nets. There are approximately ten fishers with high school education, while the rest only have elementary or intermediate school. Approximately half of them are full-time fishers and the other half are part-time with additional seasonal jobs to support their families. Some of them work in the manufacture industry during the week and only fish during the weekends.

The third fishing community is called El Tamarindo. Like the Barrio Higuey, it is located close to downtown Aguadilla, but in the poorest section infamous for its high crime rates. Since there is no marina in Aguadilla, the School of Engineers raised funds for one; with that money they made an entrance to the sea and a *espuelon* in rocks (*rompeolas*). However, the local government did not look for private investment or someone to be in charge of the maintenance of the facilities. The project cost between $6 and $7 million, but the builders altered the original design and built only half of what was planned. Also, when they were building the marina, they

did not considered the flow of sand in the island and the potential of obstructing the accumulation of sand in the beaches at the south. Due to the redirection of the flow of sand, a new beach has been formed next to the marina. Before the construction of the marina, the beach there was rocky, completely without sand. Now the beach is smooth and sandy, making it convenient for the fishers of that area. The sand permits them to leave the *yolas* close to the water.

While this project has improved the conditions at the El Tamarindo beach, the Barrio Higuey beach has been adversely affected because all the sand that is supposed to go to the Higuey beach has now been redirected to the beach in El Tamarindo. Because the flow of sand in the island goes from north to south and from east to west, the marina retains the sand and does not let it pass, leaving the beach of Higuey rocky. Presently, the marina is full of sand and can be only used for small vessels and rowboats; originally, the marina was designed to have the capacity to hold large ships. Also, the project intended to provide facilities to all the fishers' organizations of Aguadilla. Now, only the Association of the Black Cat has working space there. As for other artisanal fishers' association, small fish shops serve as the base for their organization.

Local Issues

Fisheries management is seen in a very negative light in Aguadilla, and especially among the artisanal fishers in Higuey. Respondents at Barrio Higuey pointed out that the federal government imposes laws without accounting for the fishermen. They feel that regulations for billfishes are designed for wealthy recreational fishers and do not account for the needs and the opinion of poorer artisanal fishers. They are very angry at what they consider is discrimination against the artisanal fishers and persecution by the government agencies. They threaten to cease informing the fishing statistics to the Fisheries Laboratory as a form of protest since the fishers who pay $25 for the vessel registration do not have to report. If they have to go to the black market to sell the fish, they will. They argue that the recreational fishers catch approximately 200 marlins in each tournament, and the authorities do not do anything about it. However, if an artisanal fisher catches one marlin, the agencies start harassing him. The fishers were quite adamant that regardless of regulations, they intend to sell their fish "under the table."

The Department of Natural Resources has a serious legitimacy problem with the artisanal fishers in Aguadilla. The fishers feel that there is a lack of information from the government agencies about fishing regulations. The fishers of the association find out about the new management plans only through the press. No one tells them about changes in the regulations, despite the fact that there is a Department of Natural Resources located on the next block. Another concern is deforestation of the area; this concern arose because the mayor wanted to cut the trees near the beach. The fishers complained with the Department of Natural Resources without results. The department never responded to their calls and never met with the appointments. It was understood that this same office was to have promised a boat ramp for the artisanal fishermen and to improve the infrastructure of the fish shop, yet they never did. There are also problems with the Department of Natural Resources' Fisheries Laboratory. For many fishers, the registrations for the vessels cost between $100 and $200 because they are not appearing in the official lists of artisanal fishermen of Puerto Rico; appearance in the official lists means a discount in the registration fee. In fact, the president of the association of El Higuey did not

appear on the lists for three years. This has been the third consecutive year in which he has had to go to the Fisheries Laboratory to claim.

The local government does not offer any incentives to youngsters who want to learn fishing techniques and continue as full time fishers. There are no training programs either to improve the already existing techniques. The local government does not want to adopt an active role in the preservation of this activity as part of the cultural life of the area. Even in the case of the only traditional activity related to fishing, the *Paseo de la Virgen del Carmen*, the local government does not give any financial support nor provides the necessary advertisement to transform it into a major tourist attraction. A manifestation of the cultural role of the fisheries in Aguadilla, the celebration of the *Festival de la Virgen del Carmen* is a general celebration in different parts of the island. In this festival, the artisanal fishermen take a statue of *La Virgen del Carmen* out in the *yolas*. The Fishers Association of Higuey conducts a Fishing Tournament in which only local artisanal fishermen participate. The members of the *Club Nautico El Parterre* also participate if they have a *yola*. Motorized vessels are not permitted. The *Club Nautico* also has a small sports fishing tournament for its members.

Another serious problem raised by Aguadilla fishers is the flourishing industry of ornamental (aquarium) fishes. This industry generates from thousands to millions of dollars each year. Because this business is very lucrative, local youngsters are catching so much fish and other species leaving the reefs "clean." Each fish can be sold for $5 or $6. To harvest these fish, they pour a solution into the water that puts all the organisms to sleep, in that way, they can easily catch as much they want.

Finally, gear conflicts are a problem between the local fishers and foreign, which can also mean US, fishing fleets, particularly longliners. These boats extend their main lines inside Puerto Rican waters and the authorities do not intervene. Fishers have their own forms of protest against these boats; for example, many will cut the longliners fishing lines during the night. They also raise the lines and take the fish. The fishers see the government as taking the side of the larger boats. They claim that a high official in the Department of Natural Resources has an ownership interest in three of the longliners. Informants say that this official told the local fishermen that they had to make room for the longliners and leave them alone because if they do not, the larger boats will run over them.

ARECIBO COMMUNITY PROFILE

Population

The total population of Arecibo is 93,385, of which 45,102 are men and 48,283 are women. Approximately 99% of the population of Arecibo were born in Puerto Rico or in the US. In the US ethnic classification system the majority of the population will be classified as Hispanic or Latino. Naturalized citizens and non-citizens each make up less than 1% of the population of Aguadilla, but their ethnicity is unknown. According to interviews with local government officials, the vast majority of immigrants in Arecibo are from the Dominican Republic; however, there is no way to confirm that information due to waves of illegal immigration.

Households, Income and Poverty

In Arecibo, there are 24,333 family households. The median household income is $7,520. Thirty-two percent of the households are receiving some kind of public assistance; the average public assistance income is $1,939. Fifty-eight percent of the households receive salary or wage income; the average salary or wage income is $13,405. Twenty-two percent of the family households have female householders; seventy-three percent of these are below the poverty level. The general poverty rate is 57% for Arecibo.

Education

Just under half (47.2%) of the adult population of Arecibo are high school graduates, according to the 1990 Census. Approximately 10% of the adult population can not read or write. Table 8.7 gives additional information on the literacy and education levels in Arecibo.

TABLE 8.7
ADULT LITERACY AND EDUCATIONAL ATTAINMENT
ARECIBO, PR
Source: U.S. Bureau of the Census

	# of Adult Persons	% of Adult Persons
Adult Population	65,211	100.0
Adults Not Able to Read or Write	7,185	11.0
High School Graduates	30,772	47.2
College Graduates	6,196	9.5

Employment

Of the population age 16 and older, 43.9% are in the civilian labor force. The unemployment rate is approximately 23%; this is slightly higher than the unemployment rate for all of Puerto Rico (20%). In 1990, the highest employing industries for men and women were *manufacturing* and *services*. Tables 8.8 and 8.9 give additional information from the 1990 Census on employment in Arecibo.

TABLE 8.8 LABOR FORCE PARTICIPATION ARECIBO, PR Source: U.S. Bureau of the Census	
Population 16 years or older	68,835
Civilian labor force	30,203
Labor force participation	43.9%
Unemployed workers	6,932
Unemployment rate	23.0%

TABLE 8.9
EMPLOYMENT BY INDUSTRY
ARECIBO, PR
Source: U.S. Bureau of the Census

Industry Sector	# of Males Employed	# of Females Employed	Total Employed	% Employed in 1990
Agriculture	725	45	770	3.5
Silviculture and fishing	**16**	**0**	**16**	**>0.1**
Mines extraction	27	0	37	0.2
Manufacturing	2,820	2,062	4,882	21.9
Construction	1,155	60	1,215	5.5
Public services	945	215	1,160	5.2
Wholesale commerce	696	314	1,010	4.5
Retail commerce	2,261	1,218	3,479	15.6
Finance, insurance and real estate	321	220	541	2.4
Services	2,813	3,686	6,499	29.2
Public administration	1,457	1,205	2,662	12.0

Artisanal and Recreational Fishing

The most important economic role of fishing in Arecibo is as a tourist attraction. Arecibo celebrates the Zeti Festival twice a year, in October and June. The *Zeti* is a larva that is caught at the river entrance; during the festival everybody catches the *Zeti* with cans, nets or whatever they have at hand. During the festival days, the restaurants prepare traditional foods with the *Zeti's* meat. This festival, which coincides with the *Zeti's* natural patterns of migration, promotes for a few days the economic development of the local sea food industry.

Aside from the Zeti Festival, fishing plays a minor role in Arecibo's economy. Few of the local businesses depend directly on fishing, aside from the Commercial Fishers Association of Jarielito. As was the case with the artisanal fishers in Aguadilla, the Association of Jarielito is

the fish dealer for its members, which means that the association buys all the fish and resells it to local restaurants and directly to the consumers. However, the association is having problems selling the fish to the local restaurants due to a preference for frozen fish, which is considered less expensive and is better marketed. Also contributing to the problems with selling their catch is the lack of adequate facilities for preserving the fish, causing the product to become spoiled if it is not sold quickly. In general, the village and the association lose a good deal of money each month because of this lack of storage facilities, and almost no profit is generated for the fishers.

The government is required to buy all the fish that is not sold to supply jails, public schools and other government facilities; however, this is not happening. Thus, the only demand for local fish have is at the retail level. The fish is sold directly in the village by two government employees who are responsible for handling the fish and maintaining the association's facilities. On the other hand, according to government officials, many fishers own restaurants and fishing is a form of reducing their expenses and increasing profits. As far as sports fishing, there are no charter boats since the tourism industry in Arecibo is not oriented towards that kind of activity. There are only two stores that sell fishing equipment in the area, and one is associated with the Arecibo Yacht Club.

Fishing Communities

The fishing community in Arecibo is made up of three distinct units characterized by both sociological and geographic differences. The three sites are the Arecibo Yacht Club, the Village of Jarielito, and the area called *la poza del obispo*. Those areas are located less than 5 miles away from each other, configured in such a way to surround a big marina. However, they can be classified in three different communities by the socio-economic status of the fishers, their socio-political organization, fishing equipment and physical facilities. Two of them, the Arecibo Yacht Club and the Village of Jarielito, are located inside the river because the water is very violent in the north of the island and it is very difficult to come out in the boat from the shore.

The Arecibo Yacht Club is a private area, an exclusive club, created by and for the local recreational fishers. The members of the club formed the Association of Sport Fishing of Arecibo and its facilities are located in a sea entrance at the river, like a human made canal in the sand. The club has a main room for social activities, a gift and fishing equipment shop, and a harbor. The area is small but in very good condition as well as full of luxury boats. The shore is considered a recreational area and is very active with a great variety of water sports, such as jet skis and Seados.

Members of the Arecibo Yacht Club organize marlin and inshore fishing tournaments. According to local government officials, the municipality does not get any economic benefit from those tournaments because all the profits goes directly to the Club, which is a private business. The tournament does not affect the economy of the region even indirectly by promoting related business because the participants are mainly the same local fishers. The marlin tournament is held on May 5th, 6th and 7th. However, according to the commodore of the club, the tournaments are not always lucrative, even for the club. Frequently, the club loses money, especially if they receive hurricane warning, because people do not register. The inscription fees are $500 per participant. The Tourism Company of Puerto Rico, a government

agency in charge of promoting the tourism to the island, does not support the club in any form. The Tourism Company has government funds to be distributed among the Nautic Clubs to help them with the tournament expenses, but all the money goes to three clubs in the area of San Juan, which are the more well known and important clubs.

The club has approximately 253 members, and among them, 82 are boat owners. The size of the vessels fluctuates between 18 and 50 feet. The larger boats, measuring 33 feet or more, have a crew consisting of a captain and a mate. The crew is in charge of the maintenance of the boats while in the marina and directing the fishing journeys. The facilities of the club and marina were constructed with private funds. Before these facilities were built, the vessels parked in the public marina, until they created the entrance in the river. The public marina is the only thing that the government undertook for the fishers since the early 1970s. Although there are approximately twelve women among the club's members, almost all of the boat owners are men. There are only two women who are boat owners, who are also considered very good fishers. The commodore is in charge of the administration of the club's facilities. The position of commodore is filled through elections, which are done among the same associates of the club. The commodore does not receive payment for his work, which is done during the weekends and evenings since he will work during the day in most cases. Among the members of the club are cattle raisers, managers, doctors, lawyers, engineers, police officers, and politicians. It is a very exclusive place for the middle-upper class of Arecibo, although the commodore reports that in the club's facilities there is an area available for the *yolas* of the poor artisanal fishers.

Among the members are part-time artisanal fishers but most of them are recreational fishers. There are only eight artisanal fishers who, according to the commodore, depend partially on what they catch to make a living. However, usually they come out on the weekends and use the money they obtain from the catch to pay for the trip expenses. Among them, only three have a commercial license. The artisanal fishers catch mostly red snapper and grouper, which is considered bottom fishing; this kind of fishing is done with a line that goes to the bottom of the sea, mostly in rocky areas, with up to six angles vertically aligned. The rest of the fishers, the recreationalists, target mainly marlin, dolphin and tuna. To catch this species, they use a hand line, or a single cord with one angle. October through March is the season for tuna and dolphin found approximately 30 miles from the shore. November through January is the season of sawfish, during decreasing moon. And May through October, in growing moon, is the season of marlin, white needle, blue needle and *pez vela* at 7-10 miles from the shore. Fishers report that, unlike the artisanal fishers, they release undersize marlin; they also sell the marlin that they don't release.

The area called El Vigia is the artisanal fishing area. It is located in front of a public school named El Vigia, five minutes away from the Yacht Club inside the river. It has the appearance of a very poor area with only a ranch in concrete and a small office, which serves as fish shop and as the office for the Commercial Fishers Association of Jarielito. It has a fence around the area, identifying the place as property of the government for the Fishers Association of Jarielito. A sign says that they sell fresh fish and that it is prohibited by law to sell, to buy, and/or to prepare fish outside those facilities. The area also has a parking lot and a ramp for the *yolas*, which serves as the access to the river and the sea.

The Commercial Fishers Association of Jarielito has 35 members, all of them are men. Their ages fluctuate between 30 and 65 years and almost all of them have been raised in the fishing way of life. Only 3 or 4 of the members finished high school, but elementary or intermediate school is the average education level, even among the younger members. They try to teach the fishing arts to the young. Often, they take the youngsters as *proeles* during the trips, providing all the meals for them as well as giving them one third of the catch of the day as a payment. Most of the *proeles* are from the same neighborhood where the village is located. All the fishers associated to Jarielito have a commercial license and all the *yolas* are registered. The size of these vessels varies from around 18 to 24 feet. The area belongs to the local government and the mayor's office has a budget of $70,000 appropriated for the infrastructure maintenance and the salary of two employees who serve as the fish dealers of the association. The funds that come from the Municipal Development Program are designed to finance permanent infrastructure improvements in the municipality. However, there is no written evidence of that assignment in the official budget, even when the mayor is paying the salary to the two employees of the village, as well as water and electricity expenses.

The Jarielito fishers target red snapper, sawfish, grouper, tuna and dolphin. Shark and marlin are not targeted, but they are caught as bycatch. Artisanal fishers report that they sell or consume any marlin that they catch. The fishing seasons are what they call time of "bonanza," which takes place from April 15th to October 15th. During this time they fish specifically for tuna and sawfish. Usually, they fish out to about 10 miles around Arecibo, but sometimes they have to go further, until Mayaguez, in the West Coast of the island, in order to catch certain species like dolphin. However, that opportunity is limited when the type of vessel they utilize is considered. Their vessels are small and fragile with no safety equipment such as the *yolas* and the fiberglass boats. Also, on the coast of Arecibo, the Atlantic Ocean is very violent, making it very difficult to go further in their small vessels. Recently, as the fishing becomes scarce due to environmental and political reasons, the members of the organization have to seek jobs on the side. These jobs can range from auto repairs to seasonal positions in the construction industry.

The marina in Arecibo is controlled by the state. A few years ago the marina was one of the most important locations for the foreign fishing industry because longliners stopped there frequently to handle the fish. However, foreign longliners are not coming to the marina anymore, nor are the local fishing boats. They go to the marina at San Juan instead. Now the marina in Arecibo only receives diesel, corn oil, and mechanic equipment for the industrial plants located in that area. Also, some sailboats come to that marina. The government is planning to transform the marina in a packaging plant for materials to be recycled in other areas.

The area called *La poza del obispo* is located next to the lighthouse, in a small natural bay. It is an industrial area just after the marina, which seems to have been a recreational area before the industrialization of the town's economy. There is an abandoned facility was a cafeteria, a baseball park and two industrial plants a few years ago. One of the industrial plants is a corn oil processing plant and the other is textile. There are no fishers' associations in this area, just a few independent artisanal fishers.

Local Issues

According to the government officials, fishing has a very important cultural role in Arecibo. The biggest manifestation of that cultural importance is the celebration of the Zeti's Festival twice a year. However, neither the local nor the state government promotes the fishing industry or fishing related cultural activities. As in the case of Aguadilla, there is no vocational training promoted by the state oriented to improve fishing techniques or the management of the marine resources. Also, the government does not provide any incentive, such as advertisement or financial support, for the festivals or cultural activities. The official position of the local government is that the fishing industry in Arecibo does not have a great future. Other types of occupation are more valued and promoted, such as college careers and low-wage jobs in the industrial plants of the area.

The Arecibo fishers are hostile to the Department of Natural Resources, the Marine Police and the Coast Guard because of fines imposed for safety violations. They maintain that they cannot carry the required equipment because it is both too expensive and does not fit in the *yola*. This same complaint was echoed by fishers in Aguadilla. Indeed, letters were sent to all the fishers associations in the island to see if they can organize to fight together against this situation

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